

**Strategic Sovereignty:
Essays on goods provision, conflict, and governance in regions of natural resource
extraction**

by

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**A dissertation submitted in partial fulfillment
of the requirements for the degree of
Doctor of Philosophy
(Political Science)
in the University of Michigan
2014**

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Acknowledgments

There are many minds that contributed, in various ways to the development of this project. To my co-chairs - thanks to Anna Grzymala-Busse, for demonstrating discipline of thought, intellectual honesty, and patience. To Allan Stam for telling me first to think big, and then to think small and keeping the project moving along. To Scott Page, whose encouragement and guidance on the model and beyond has been invaluable. To Brian Min, whose capacity for clarification through reduction and whose demands of data have been immensely helpful, and Anne Pitcher, whose illumination of context and direction to many helpful people in the field made much of this work possible.

In addition to my committee members, I owe the completion of this project to several other mentors and colleagues. Specifically, I owe a debt to Pauline Jones Luong for her guidance, comments and constructive critique. I am also grateful to Sinziana Dorobantu for her support in obtaining the dataset, Jim Morrow for his comments on earlier versions of the model, and to Jenna Bednar for her support at the project's very earliest inception. This project was supported by funding from the Rackham International Research Award as well as the UT CCAPS program, for which I am grateful.

To the many graduate school colleagues that read portions of this project (some several times) over the last several years (including Vincent Arel-Bundock, Timm Betz, Trevor Johnston, Lisa Langdon Koch, Amy Pond, Gary Uzoni, Matt Wells, and many others) in the political science department at University of Michigan. Thanks very much to AJ Hegg, who accompanied me to DRC, Mozambique, and Zambia for the field work portion of this project, easing the burdens of traveling as a woman and enjoying the adventure, and to

Chance Copeland for keeping me smiling during the last stage of writing. To Jon Eldon, for keeping me honest and aware in the endeavor. And to my friends, especially Bonnie Washick, Joshua Shipper, and Alton Worthington without whom this process would have been a far less fruitful, engaging, and enjoyable enterprise.

Finally, to the Steinberg clan: Ben, Amy, and Jeffrey, for putting up with me as I navigated this project and listening. To mom and dad - for enduring and supporting my unrelenting questioning of all manner of things.

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Chapter 1

Introduction

The research puzzle that I address in the following chapters came out of my observations traveling during my fieldwork in graduate school and in my wanderings before I arrived in Ann Arbor. I saw that, in some regions of natural resource extraction, local communities receive goods and services and environmental consequences of extraction are mitigated, while in others these populations receive no benefits and endure negative environmental externalities of extraction, which can lead to violent protest, to which a government may respond. I observed variation in whether non state actors, such as firms, engage in goods provision, how local populations respond, and how governments respond to them.

This variation in governance outcomes is particularly puzzling because it is observable within countries, and across countries of similar state capacity. Furthermore, it is observable across the operations of a single extractive firm. As a consequence, explanations that focus on state or firm level characteristics are insufficient for understanding when extractive projects lead to local resistance, and when the government represses this kind of protest. Explaining this variation is thus a particularly messy endeavor, requiring subnational analysis that draws on multiple and cross disciplinary literatures - including literatures on the natural resource curse, protest and collective action, government repression, regulatory politics of firms and governments, and the politics of non-state goods provision. These literatures provide insight about (and methods for exploring) specific dimensions of the outcomes of interest in regions of natural resource extraction. However, an account of why we observe subnational variation of the affect of non-state actors on governance outcomes (on display particularly in extractive regions) remains absent. In this dissertation, I aim to fill that gap.

Regions of natural resource extraction present a unique microcosm for understanding local governance outcomes because they are regions where tradeoffs between revenue and political support are likely to be particularly acute. The presence of natural resources fixes a location and forces a convergence of actors, from which there are limited exit options,

ensuring territorial implication. Extractive firms in these regions often engage in the provision of goods and services such as clinics, schools, infrastructure, employment opportunities. Notably, many of these kinds of provision are part of what is traditionally captured by the notion of a modern, bureaucratic and welfare providing state. Understanding the strategic logic underpinning the interaction between a government, firm and local population can help us better explain why non-state actors engage in state-like functions (such as the provision of collective goods, social services), and how the state is likely to respond. States might retain limited presence in some regions, leading to subnational variation within *de jure* sovereign boundaries, in effect ceding *de facto* sovereignty because it is in their interest to do so. So we may view the following chapters as a way of thinking about the drivers of spatial variations in the deployment of state resources for governance, particularly in the context of limited state capacity.

To explore the local politics and governance outcomes in regions of natural resource extraction I use a formal, game theoretic model to articulate a theory of the strategic interactions among a firm, government and local population in a region of natural resource extraction. Given the subnational and within firm variation observed, naming the actors and preferences, the relevant parameters, and the order of play allows for the identification of the central dynamics that might yield such variation. The solution specifies the conditions under which firms will provide promised transfers to a local population, resistance will occur, and how the government will respond. Ultimately, the model conveys two central results: 1) the actors' beliefs about each other are central for constraining their behavior and 2) parameters such as resource interruptability, environmental externalities and costs of protest matter by way of shaping the relevant cut points of these beliefs. Broadly, the model examines a scenario in which a non-state actor has incentives to engage in goods provision, and in which the state may have an incentive to compel it to do so. It outlines the logic underpinning the incentives for goods provision in regions in which non-state actors are a relevant, resource endowed actor which can shape the way governments manage tradeoffs in the extraction of political support and revenue.

In the second chapter I consider how this stylized model plays out on the ground. I identify the actors and trace their beliefs that result in the outcomes that characterize four coal and copper extractive sites in Mozambique, Zambia, and DRC. Specifically, I describe how in some of these regions governments monitor and regulate extractive firm behavior, ensuring they engage in goods provision and mitigate adverse consequences, while in others they respond to local discontent with repressive campaigns. The case analysis presents a plausible account of the formation and implications of the beliefs actors have about each other, which are central to understanding the conflict and regulatory outcomes predicted by

the formal model.

The goal of chapters three and four is to evaluate the factors that systematically contribute to the subnational and within firm variation in protest and repression around extractive sites. In these chapters, I use an empirical dataset to test several hypotheses that emerge from the model, lending support for the veracity of its characterization of the local logic. While similar studies have considered the importance of the presence of natural resources for larger phenomena such as civil wars and failed growth at the national level, I use a dataset that includes the location of mineral extraction projects and individual conflict events to consider the local outcomes of resource extraction. In chapter three, I explore why some sites of natural resource extraction see local resistance and others do not. The analysis suggests that environmental vulnerability and firm beliefs matter significantly for shaping the likelihood of protest, as suggested by the model. In chapter four I evaluate how proximity to a mining site affects the likelihood that a conflict event is repressed, and furthermore, how the government dependence on mineral rents affect this likelihood. Governments are more likely to engage in repression of a conflict event if it is near a mineral extractive site and if the government is particularly dependent on mineral revenues. Taken together, these empirical chapters provide support for the generalizability of the dynamics suggested by formal model and case analysis across extractive regions in Africa.

Chapter 2

Strategic Sovereignty: A Model of Non-State Goods Provision and Resistance in Regions of Natural Resource Extraction

Each year, approximately 10 million people are affected by development projects, including natural resource extractive projects.¹ In some regions of natural resource extraction, local populations receive goods and services and environmental consequences of extraction are mitigated. In others, these populations receive none of the benefits of extraction and endure negative environmental externalities, which can lead to violent protest. While these are local outcomes, they have consequences for both the recipients and sources of the more than \$US 200 billion in FDI in the mining and petroleum sector.² For example, in 2009, more than fifty five percent of the \$US 890 million in FDI to Mozambique went to the extractive sector,³ in large part to begin development of the coal deposits found in the northwest province, Tete. International extractive firms such as Brazil's Vale and Australia's Rio Tinto, bid on concessions in which to build open pit mines to extract the coal. The firms received adjacent coal concessions and began construction of the Moatize Mine and Benga Project, respectively. Both projects required the resettlement of thousands of people and created strains on resources required to sustain the livelihoods of these residents. In January 2012, approximately 500 families relocated by Vale, barricaded the Sena rail line which delivers coal from the Moatize mine to the port of Beira on the eastern coast of Mozambique, halting

¹Cernea (2000)

²United Nations Conference on Trade and Development (2012)

³United Nations Conference on Trade and Development (2011)

export and costing the firm over \$US1 million in a few hours. The protestors asserted that the company had not fulfilled the promises it had made to them to improve living standards. Specifically, the local population's capacity to grow and sell crops was significantly disrupted by the firm's coal extraction and the compensatory housing and farmland did not meet the standards which the local population believed had been promised to them. Though Rio Tinto made similar promises concerning the relocation of the residents in its concession, it has avoided this kind of protest to date.

As the vignette suggests, not all regions with significant natural resource extraction experience protest. Instead, local populations may receive sufficient compensation, even if there are negative effects of extraction, or they may fail to successfully protest if they are not compensated. Frequently, it is the extractive firm that promises this compensation, which is surprising in the absence of northern NGOs that might engage in naming and shaming campaigns in an attempt to affect firm reputation.⁴ Yet variation in these outcomes exists even across geographic regions of extraction managed by the same firm, as Rio Tinto found when it faced protest at its extractive site in Madagascar.⁵ A firm's failure to follow through can lead to protest, to which the state may respond, siding with the protestors or engaging in a repressive campaign.

This question is the subject of NGO reports and media campaigns which regularly hinge on a normative assessment of the actors' motivations and behaviors. I rely on a rational actor framework for understanding firm and government behavior, introducing the local population as a relevant and important actor. Specifically, in regions with abundant natural resources, extraction can both provide the impetus for distributive conflict over resource revenues, and produce localized externalities for an embedded population. These populations have the potential to impose costs on either the extractor or the government if they are not compensated. The strategic interaction among the government, extractive firm, and local population can result in a transfer to the local population in order to ensure that it does not protest.

Exploration of these local outcomes can shed light on a broader theoretical inquiry concerning localized goods provision such as infrastructure and welfare goods and sub-national variation in government presence across its sovereign territory. I examine regions of natural resource extraction, where we would expect states to maximize their presence given the region's potential wealth. Economic and political tradeoffs to state presence are likely to be particularly acute as the presence of natural resources fixes a location and forces a convergence of actors. As a result, these regions present governments with choices: the government

⁴Peloza (2006)

⁵*Rio Tinto threatens to exit Madagascar after CEO is trapped by protesters* (2013)

must assess the economic benefits of extraction and the value of political support in the region and make a calculation about how to manage tradeoffs that might arise between these alternatives. The outcome of such a calculation can result in the maintenance of regions of weak state presence, regions in which the extractive firm, not the state, provides goods and services to an embedded, local population.

The next section examines the relevant literature for the development of a theory about local outcomes of natural resource extraction. Following that, I outline a theory and model of these outcomes, after which I analyze the results and provide a discussion and conclusion.

Review of Relevant Literature

I draw on strands from several relevant bodies of literature, as there is no single body of literature that addresses the research puzzle at hand. Understanding the interactions that shape local outcomes in extractive regions requires a discussion of various iterations of the resource curse, a burgeoning literature on non-state goods provision, and the more canonical rationalist explanations of conflict. Each of these discussions provides relevant insights for understanding the variation in outcomes, though each on their own is insufficient to explain this variation.

There is a prolific literature on the effects of natural resource rents on conflict, much of which relates extraction to regime stability⁶ or civil war⁷, a more intense and broader scope of internal conflict than I am concerned with here. While this body of work suggests that incentives of elites at the national level matter for the management and distribution of resource rents, and that resource rents can, in turn, affect elite behavior, it suggests little about how resource rents are likely to shape how political elites interact with other actors at the geographic point of access to the resource. This is surprising since such interactions are likely to have significant consequences for the stability of elite access to these rents. As a consequence of this trend, political elites tend to be the primary actors in these studies, while the local populations are not regularly acknowledged, though these populations may become the source of regional unrest (consider the case of Nigeria in Watts (2004)).

This is not to say that scholars have ignored how characteristics of the extractive context affect natural resource related instability at the local level. Watts (2004) and Le Billon (2001) suggest the importance of the physical and social context of extraction for understanding variation in resource extraction outcomes in their qualitative case studies of the Niger Delta

⁶Morrison (2009); Robinson, Torvik and Verdier (2006)

⁷Ballentine (2003); Berdal and Malone (2000); Collier and Hoeffler (2005); Fearon (2005); Ross (2004); Ross (2006); Klare (2001); Le Billon (2001*a*); Le Billon (2001*b*); Soysa and Neumayer (2007)

and Angola’s Cabinda region. They introduce the extractive firm as an actor in the local landscape, since in most resource-rich countries, the capital and technical investment for extraction is provided by a firm, making it a relevant and visible local actor. These authors, along with Snyder and Bhavnani (2005), demonstrate that the context of resource extraction, including the engagement of local actors other than the state, is relevant for understanding how natural resource extraction affects local instability.

This work, along with extensive case study⁸ suggests that actors such as firms and local communities interact with the state in and around extractive sites to realize preferences regarding the distribution of the costs and benefits of extraction. Specifically, resistance toward natural resource related development projects can emerge when local communities observe the potential benefits as well as costly consequences of extraction. Such resistance can be costly to all parties involved, leading parties to attempt to reach an alternative solution. Firms promise compensation to secure a “social license to operate” in order to prevent such costly conflict. In fact, the idea of ‘corporate social responsibility’ as a strategic behavior is explored by Baron (2001) and others⁹, and cited explicitly by industry as a way of heading off potential costly protest. Given the costliness of the protest for governments receiving revenues from extraction, states too have an incentive to limit the likelihood of protest, if doing so is not more costly than the protest itself.

When framed this way, a rationalist approach appears appropriate for uncovering the strategic logic resulting in localized conflict in regions of natural resource extraction. As Fearon (1995) describes, such explanations tend to fall into two categories: conflict resulting from the existence of private information, or conflict resulting from commitment problems.¹⁰ The extractive context is best characterized as one of uncertainty derived from the existence of private information about the costliness of protest to the local population, and the costliness of government response to such resistance. But as Pierskalla (2010) argues, formal models of protest and repression are somewhat limited, and variation in strategic context is limited. While such models typically consider two actors, and seek to understand the effect of repression on protest this literature demonstrates that repression can in fact carry political costs, in addition to the monetary costs modeled in other canonical models of larger scale phenomena (such as Acemoglu and Robinson (2001)). I am interested precisely in when

⁸Hilson (2002); Castro and Nielsen (2001); Kapelus (2002)

⁹Khanna (2001); Khanna and Anton (2002)

¹⁰The traditional commitment problem is not a particularly useful foil for the extractive context in which a firm, local population and government interact in a local environment. This is in part because commitment problems indicate that an acceptable alternative to conflict is available, and that actors are aware of it, but that they have incentives to renege on that solution. In the subnational context of natural resource extraction, I am interested in the state’s strategic incentive to act as an enforcer. The state can indeed choose to enforce a commitment by the firm, if it is a best reply.

governments employ repression to protect access to revenue from natural resources, given that repression has political costs, which might vary.

The potential of costly resistance shapes the strategic incentives of the extractive firm and the state, and compels the state to manage tradeoffs between access to resource revenue and potential political consequences of resistance where natural resources and a politically relevant population occupy the same space. Thus from a broader theoretical approach, this study builds on literature about regions of limited state presence, by explicitly considering how and why regions of limited state presence might be sustained, with specific reference to regions of natural resource extraction where we might most expect states to maximize their presence, given the revenue potential. Specifically, such regions reflect the outcome of a strategic interaction among a firm who may engage in the work of goods provision and even local governance, a government who may value the revenue provided by the firm more than any political support it might receive from engagement in the region, and an embedded local population with the potential to offer support or impose costs on the firm or the state. In order to understand this sub-national variation in state presence, it is necessary to develop a theory that captures the strategic interactions between these actors, since it is these interactions that can yield the conditions under which each of the actors' behavior is constrained.

Theory and Model

Broadly speaking, the conventional wisdom in political science is that natural resources are a “free” source of revenue for the government: the cost of obtaining the rents from their extraction is the economic cost of extracting them. In comparison to tax revenue, which if too high can distort productive incentives and requires an implicit or explicit contract with taxpayers about the use of such revenue, revenues derived from natural resources do not come with obligation, nor do they impose a significant bargaining cost for obtaining them.

Yet natural resource extraction creates the potential for costly (if localized) distributive conflict over access to revenues from extraction, particularly when such extraction also produces negative externalities for local populations already living in the region. Specifically, natural resource extraction can affect the livelihoods of local populations that often rely on access to land and natural capital in these areas. For example, depletion of local water supply for drinking or agriculture, or use of scarce local resources such as timber for construction of scaffolding around mine entrances, or land for open pit construction can immediately and adversely affect local livelihoods.

The fixed, geographic nature of natural resources makes local populations likely to make

claims to the resource or revenues from its extraction. While property rights regimes may affect the extent to which there are legal avenues for claim making by local populations (thus potentially lessening the need for protest), it is reasonable that these populations feel greater entitlement to the resource over which they live, particularly if they are adversely affected by its extraction, then they might feel toward other types of FDI (this phenomenon has been dubbed “local resource nationalism” by some).¹¹ Thus, as a result of direct claims to ownership of the resource or negative externalities of extraction, local populations may view an extractive firm as exploitative and resistance may arise. In Scott’s (1987) discussion of peasant resistance in the context of significant power asymmetries, he elucidates two relevant insights. First, he notes that “resistance is not necessarily directed at the immediate source of appropriation...[these groups] must simply follow the line of least resistance.”¹² The presence of the infrastructure for natural resource extraction presents a target at which local populations can direct resistance efforts, by lowering the traditional barriers to collective action. Second, Scott demonstrates that the peasants’ beliefs about the probability and severity of retaliation for such resistance can shape their decision to engage in resistance, making the state a relevant factor in the local population’s decision to protest.

Firms recognize this potential for costly conflict, but the locational rigidity of natural resources limits a firm’s exit options, as well as its investment choices. Sunk costs deter relocation, which is further exacerbated by limited geographic distribution of the resource. Consequently, regions of extraction regularly compel interaction and engagement with a local population, leading them to incur costs to mitigate the consequences of extraction and act as a local redistributor (as Baron points out). Bennett (2002) and Gunningham et al. (2004) provide evidence of variation in these efforts, and discovering that “some companies took a strategic approach, such as ‘buying off’ the local community’s objections... by offering to supply it with better-quality drinking water.”¹³ As these studies show, the firm incurs the costs of providing goods to the local population in order to avoid future, larger costs of protest. Furthermore, as work by Brousseau and Fares (2000) and Wolf, Deitelhoff, and Engert (2007) indicates, specific local and environmental conditions shape the costs of this kind of firm behavior in a given region. Ultimately, natural resource rents are not a free revenue source; the costs of obtaining them are shaped by variation in specific characteristics of the extractive context, including the presence of an embedded population.

Because the costs of protest accrue to both the firm (lost profit) and the government (lost tax revenue), state actors may wish to compel the firm to honor their remunerative

¹¹Aravat (2012)

¹²Scott (1987) pp. 35

¹³Gunningham, Kagan and Thornton (2004) pp. 326

commitments in the event of protest. Alternatively they may ignore or repress the local population.¹⁴ However, in addition to monetary costs that protest may impose, protest by the local population can impose political costs on the state.¹⁵ These costs depend on the extent to which the government relies on the political support of the local population in the extractive region to retain power. In sum, the firm and state aim to ensure continued profits from extraction, while minimizing the monetary and political costs of not doing so, and thus may offer some transfer to the local population to prevent costly protest.

In the model that follows, I build on the idea that social spending in regions of natural resource extraction is a strategic decision, and that there are specific localized characteristics that make resource rents more or less accessible to the state, and the region more or less politically salient. Next I describe the strategic interaction between a firm, government and local population in an extractive region to understand the conditions under which a) a firm invests in mitigating environmental consequences and providing compensation to a local population; b) a local population engages in violent protest; and c) the government represses the local population in the event of protest. First I discuss the actors, parameters, and variables. Next I discuss the order of play and the outcomes that emerge and the comparative statics.

Actors, Parameters, and Variables

Consider three actors in a region of natural resource extraction: the government (G), the extractive firm (F), and the local population (LP). The firm makes profit, π on extraction, of which it must pay $\tau\pi$ (where τ is a general tax rate on resource revenue) to the government.¹⁶ Once the firm begins extracting the resource, it produces environmental externalities, L , which affect the local population negatively if the firm does not incur costs to mitigate or prevent them. For example, toxic run-off from a mine may affect the local population's capacity to grow crops. Alternatively, local populations may be displaced as a result of the mining activities. As a result, the firm may choose to make a transfer, T , which may be some combination of goods and services and monetary compensation to the

¹⁴This builds on the idea put forth by authors such as Mayntz and Scharpf (1995), Scharpf (1997), and Heritier and Lehmkuhl (2008), that the state casts a shadow of hierarchy which can incentivize firm behavior and the threat of state intervention can make voluntary commitments more binding.

¹⁵Reputation costs may accrue to the firm (in addition to financial costs of protest). However, they are unlikely to affect firm behavior strategically because in order to do so they must be observable to consumers and stakeholders, which might be signaled by protest. When this is the case, the reputation cost accrues whenever the local population protests, and thus only makes the value of protest worse for the firm, but does not change the dynamics of the game.

¹⁶In this model, τ is a parameter determined before the game, and the government cannot alter the tax rate during the game.

local population in order to compensate them for this loss.¹⁷ Such transfers by the firm often include infrastructure, local training for employment, social services such as a medical clinic or school, and in the case of resettlement, new housing and land allocation.¹⁸

However, the environmental externalities differ with local context, specifically by the nature of the resource and the environment. For instance, copper and coal both require significant infrastructure for extraction, but copper has fewer detrimental environmental effects, on average. Consequently, the cost to mitigating L , and thus the cost of providing transfer T varies with the local environmental effects of extraction, and thus the cost to the firm of making transfer T is $\chi(T)$. In the model, $T \geq 0$, $\chi'(T) > 0$, and $\chi(T)$ is twice differentiable and convex. Note that when the local population receives the transfer, it also avoids the environmental externalities of extraction, and similarly, when the local population does not receive the transfer, it does in fact endure adverse consequences of extraction. Thus, the parameters L and T are linked, and may be considered the local population's 'stake'.

If the local population protests, it destroys some amount $r \leq \pi$ of revenues from extraction at some cost to it, c . The firm and the government are aware of the environmental externalities which may affect the local population, L , and the financial and political costs if the local population protests. However, neither is aware of how costly it is for the local population to protest. LP can take one of two types: LP_l and LP_h where the cost to protest to $LP_l = c_l$, and the cost to $LP_h = c_h$ ($0 \leq c_l \leq c_h$). Neither the government nor the firm knows whether it is dealing with a local population that has a high cost of protesting or one that has a low cost. Their beliefs about the type will therefore play a significant role in which outcome occurs.

The local context of extraction can determine how much the local population can destroy in protest, r , and the effort required to do so. One empirical measure of r is the value of the resource that is extracted per day.¹⁹ The parameter $0 < m \leq 1$ expresses the level of *interruptability* of natural resource extraction. The level of interruptability is inversely defined by m , and thus the lower m is, the more interruptable the revenue stream is. One may think of m as the effort required to interrupt the resource and destroy r . For example, surface oil pipelines present opportunities for discontented members of the local population

¹⁷The payment might also be a lump sum transfer without altering the model dynamics.

¹⁸There may be direct positive consequences of some of these transfers for the firm, i.e. the multiplier effect. For instance, the building and maintenance of roads is both a good for the local population and lowers the cost of operations for the company, and thus may not be a net cost to the firm. In this model, I consider the transfer to be those goods and services which represent an investment which the firm would not otherwise make if there was no local population in the area.

¹⁹It is important to note that the resource does not need to have value in the hands of the local population (as compared with lootability in the civil war literature described by Weinstein (2005), Snyder (2006) and others, though in this case it would be an added bonus for the local population if it has high liquidity).

to damage the pipeline and to restrict the flow of oil. In contrast, off shore oil reserves require more planning, more resources and more time to access and interrupt. There is evidence of such kinds of interruption of pipelines in the Niger delta, where local populations have been significantly adversely affected by oil extraction there, and also in Mozambique, where only a single railroad takes coal from mines in Tete to the port of Beira. In the model, if there is a single avenue of transporting extracted resource, then m is closer to 0 than to 1.

Both the government and the firm incur some financial cost if the local population protests as this reduces the firm's taxable revenue stream. The government also incurs a political costs if the local population protests. If the state represses the protest, it incurs some political cost, γ_R for having done so. If the government compels the firm to follow through on its promise, enforcing the agreement, the government incurs cost E . It is helpful to think of E as the government's reliance on the firm for investment and thus, consider it to be the effect of forgone revenue in the form of future investment should the government compel the firm to make transfer T (at firm cost $\chi(T)$).

The government may also gain politically from compelling the firm to follow through. The political gain to the government, γ_E , is manifest in the government's capacity to claim credit for the firm's transfer. For instance, a political party interested in consolidating support in a region can tout its role in ensuring the firm provided employment opportunities. However, the local population is not certain whether, should it protest, the government will side with the firm and repress the protest, or whether it will side with the local population (and compel the firm to make the transfer).

While both the firm and the government know the value of E , and thus whether the state will repress a protest or compel the firm to make a transfer, the local population does not have complete information about the value of E . Though a strong assumption of asymmetrical information, it is not unreasonable to consider that firms have more information than local populations do about the extent to which the government relies on their continued investment, given that firms are aware of alternative extractive sites in other countries.²⁰ Furthermore, firms with the resources to invest in large-scale mining projects are also likely to invest in gathering information about the context of extraction.

If the local population protests and the government represses, the local population incurs an additional violence cost, v , such that a protest that the government represses costs the local population $c + v$. Consequently, it must decide to protest based on its belief about the government's type and the added cost of protesting, should the government repress. Another way of expressing this is that the local population is not sure whether the firm has

²⁰I do not address, here the effect of competition of firms on the cost of enforcement parameter for simplicity, as it is outside the scope of the model

the government's support (i.e. that the government will repress a protest) or whether the government will support the local population.

Sequence of Play

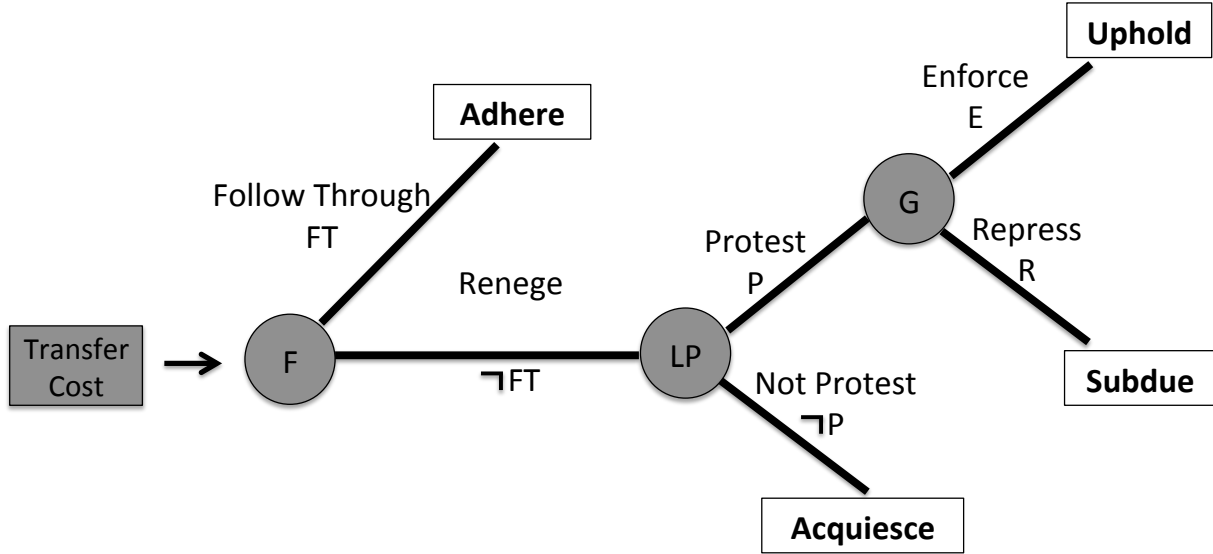
The game consists of a realization of a random variable followed by three decision nodes, each made by a different actor. The sequence of play is represented in Figure 1. Prior to any actor making a choice, the firm realizes the cost ($\chi(T)$) of the previously agreed upon transfer of goods, services, and monetary transfers (T). At this point the firm decides whether to follow through (FT) and make the promised transfer, producing the outcome labeled **Adhere**, or to renege ($\neg FT$). If the firm makes the transfer, the firm receives the revenue from extraction less the cost of the transfer, taxed at rate τ . The local population receives the promised transfer, and the government receives tax revenue from extraction (less the cost of the transfer). This is the outcome most preferred by the local population as environmental consequences are mitigated and they receive compensation for lost livelihoods.

If the firm chooses not to follow through on the contract, the local population then decides whether or not to protest. If the local population does not protest, they endure the unmitigated externalities of extraction, experiencing a loss of L . I label this outcome **Acquiesce**, in which the firm receives the revenue from extraction after taxation at rate τ and the government receives taxes on the revenue yielded from extraction by the firm. This is the outcome most preferred by the firm, and (short of a sufficiently large political benefit from compelling the firm to follow through) by the government.

If the local population decides to protest, then the government decides whether or not to uphold the contract. If the government does not uphold the contract, it represses the protest. I label this outcome **Subdue**, in which the government receives the tax revenue from resource profits (less the value lost in the protest) but loses political support in the region as a result of repressing the protest. In this outcome, the local population endures the environmental externalities, as well as the cost of protest, which is increased by a violence cost (v) that results when the government represses. This is the local population's least preferred outcome. The firm receives the value of extractive revenue less what is destroyed in protest, taxed at rate τ .

If the government upholds the contract, the government receives tax revenue from extraction (less what was lost in the protest and the firm's cost of the transfer) and the political support for compelling the firm make the transfer. However, it endures the cost of enforcement. I label this outcome **Uphold**. The local population receives the value of the transfer less the cost of protest (scaled by the interruptability of the resource). In this outcome, the

Figure 2.1: Sequence of Play and Payoffs



Payoffs			
Outcome	<i>Firm</i>	<i>Local Population</i>	<i>Government</i>
Adhere	$(1 - \tau)(\pi - \chi(T))$	T	$\tau(\pi - \chi(T))$
Acquiesce	$(1 - \tau)\pi$	$-L$	$\tau\pi$
Subdue	$(1 - \tau)(\pi - r)$	$-L - (cm + v)$	$\tau(\pi - r) - \gamma_R$
Uphold	$(1 - \tau)(\pi - r - \chi(T))$	$T - cm$	$\tau(\pi - r - \chi(T)) - E + \gamma_E$

firm receives the revenue from extraction less the amount destroyed in protest and the cost of the transfer, taxed at rate τ . This is the firm's least preferred outcome, since it suffers both the loss from the protest and the cost of the transfer. All payoffs for all four outcomes are shown in the table below Figure 1.

Recall that at the time of the offer, neither the firm nor the government is aware of the local population's type (whether $LP = LP_h$ or $LP = LP_l$). However, the firm is aware of whether the government will repress, siding with the company, or whether it will uphold the agreement. Additionally, at the point at which the local population decides to protest, it is uncertain whether the government will uphold the contract or repress the protest.

Note that the firm's first move is to decide to make the promised transfer or not, which suggests a pre-game bargaining stage. However if we assume that the firm has knowledge of the local context and the value of a transfer that would adequately compensate the local population for externalities of extraction through the efforts of a third party, the value of the transfer would be exogenously set at this amount. Empirically, it is generally the case that after being awarded the contract for a large extractive operation, third party operators provide qualitative criteria for this compensation to which the firm must agree before it can begin construction. Resettlement Action Plans and Environmental Impact Assessments that are conducted once the contract has been awarded to a firm detail the demographics, environmental risks, and potential effects on local livelihoods at the level of the individual in an affected village.^{21 22}

Additionally, note that the local population only considers protesting if they do not receive an offer they were promised. If the firm follows through with an offer, even if the offer is small, the local population does not protest. While this is a strong assumption, communities in mining regions in Zambia and Mozambique²³ have indicated that failure to deliver what was promised to them was more directly linked to their sentiment about the firm than the size of the offer. While the observable presence of a large mining company entices local populations to ask for some level of distribution of rents from extraction, the World Bank and IMF guidelines (in conjunction with environmental and social impact assessment that nearly all large scale firms conduct about the effects of mining) provide the information relevant for the firm to know the value of a transfer that will compensate the local population for consequences of extraction. Thus the value of T is predetermined, and consequently, it is

²¹Golder Associates (2009); Golder Associates, Impacto: Projectos e Estudos Ambientais and Riversdale Mining (2009); Consultec Consultoria Associados, Diagonal Urbana and ERM Brasil Ltda (2006)

²²This model is primarily concerned with the provision of some localized transfer - the parameters affecting the size of the transfer for generally, and the combination of public and private goods is beyond the scope of the current model.

²³The author conducted field work, including participant observation in mining communities in Zambia and Mozambique during 2012.

never in the firm's interest to promise a transfer that is larger than it plans to deliver, since the population will respond to the firm's failure to deliver what it promised, not the actual size of the transfer.

Analysis

The model supports all four possible outcomes: **adhere**, **acquiesce**, **subdue**, and **uphold**. Below I describe the conditions under which each outcome is sustainable. The outcomes hinge on the beliefs of each actor, and the parameters of the model determine the cut points of each actors' beliefs (depicted in Figures 2 and 3) that constrain their behavior. The figures convey the extent to which extreme values of the local population's beliefs about repression (μ) are sufficient to determine the observed outcome, but that when μ is in a middle range, the firm's belief about the local population's type (ρ) becomes relevant for determining the outcome.

Let's first consider how the local population's beliefs influence the outcomes. If the local population believes that the probability of repression is sufficiently low, and therefore is likely to protest, the firm will make the transfer leading to the **adhere** outcome. That probability decreases as the local population's stake ($L + T$) increases, the violence cost falls, or the resource revenue stream becomes more easily interruptible.

If the local population believes that the probability of repression is sufficiently high, the firm will renege, but the local population will not protest, resulting in the outcome of **acquiesce**. That probability increases as the local population's stake ($L + T$) increases, the violence cost increases, or the resource revenue stream becomes less interruptible.

However, as demonstrated in Figure 2, between these sufficiently high and low probabilities, there is a middle region expanded in Figure 3, where the firm and government's beliefs about the likelihood of protest matter a great deal.

Figure 3 demonstrates how the beliefs about the likelihood of protest determine the outcome. If the firm believes with sufficiently low probability that the local population will protest, and it is sufficiently costly for the government to enforce the contract, the government represses a protest from a local population, resulting in the outcome **subdue**. The probability decreases as the value lost in a protest increases, and as the cost of the transfer ($\chi(T)$) grows. The point at which it is sufficiently costly for the government to enforce the contract decreases as the political relevance of the local population increases, and as the costs of the transfer and the tax rate decrease.

* If $\chi(T) > r$, this region does not exist.

Figure 2.2: Population Beliefs

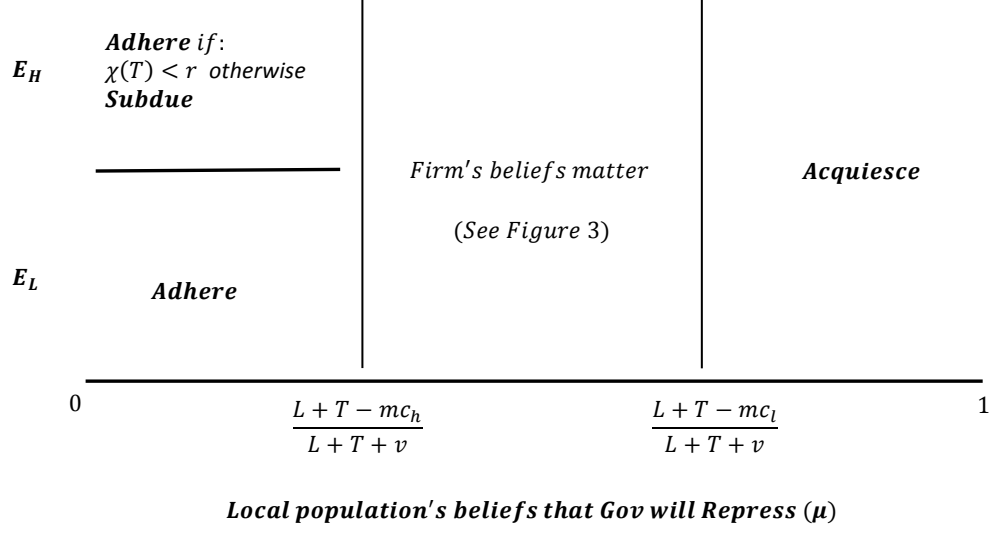
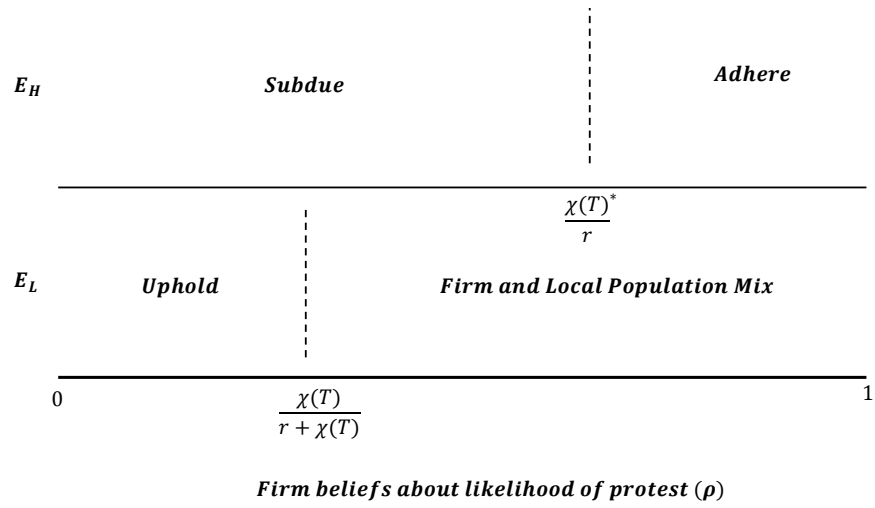


Figure 2.3: Firm Beliefs

Under conditions $\frac{L+T-mc_h}{L+T+v} < \mu < \frac{L+T-mc_l}{L+T+v}$ and $LP = LP_l$



In the event of a protest, the government will compel the firm to make the transfer if there are sufficient political costs to repression. Similar to the **subdue** outcome just discussed, the opportunity for protest will only arise if the firm believes with sufficiently low probability that the local population will protest. Again, that probability decreases as the value lost in a protest increases, and as the cost of the transfer to the local population grows. However, the effect of these two parameters on that probability is weaker than in **subdue** outcome just described.

This is not to suggest that the parameters in the model do not matter, but only that they matter by way of affecting the degree to which beliefs constrain behaviors. Because the parameters shape the relevant cutoffs of the actors' beliefs, it is important to briefly recap those parameters that are most relevant. First, perhaps not surprisingly, regions where the environmental externalities are the most costly to mitigate are more likely to experience both protest and repression. Consider that when the cost to the firm of providing the transfer is high relative to the value of the transfer to the local population (i.e. mitigation costs might be particularly high), the firm's belief about the likelihood of protest is less restrictive and thus we are less likely to observe the outcome of **adhere**. Since the cost of the transfer cuts into government revenues, it also affects the government's decision to subdue or to uphold the contract. Consequently, when the cost of the transfer leads the firm to renege, the government is also more likely to repress a protest if it occurs. Thus, independent, impartial assessments of the impacts of firm operations in a region, which determine the value of the transfer and its cost, may in fact make the contracted outcome *less* likely because firms have limited control over what they promise, and what constitutes sufficient compensation.

Relatedly, the infrastructural context, specifically, the interruptability of the resource revenue stream (m) and the value of the resource that is extracted (r) affect the likelihood of the contracted outcome. As the value extracted increases, we are more likely to observe the outcome **adhere** (relative to the other outcomes) since this makes protest more costly to the firm and government. As the interruptability of the resource increases, the local population is more likely to protest, since the local population's prior about the government's type becomes less restrictive (at the same time making the firm more likely to make the promised transfer). Finally, and interestingly, higher tax rates create a greater stake for the government in an extractive region, making it more willing to repress to protect that stake. As a consequence, the firm is more likely to renege when it is being heavily taxed, since it is less likely that the government will compel it to make the transfer.

To situate the model in the context of rational theories of conflict I reiterate that conflict (more accurately, protest) in the case of extractive regions is better characterized as the result of incomplete information as opposed to a commitment problem. The state can in

fact act as an enforcer, and it is the state's calculation about repression versus enforcement of the contract that is of interest. Given that the actors' beliefs about each other shape the likelihood of each outcome, it is important to consider what incentives there might be for each actor to misrepresent its type. However, the strategic context (and consequently, the format of the game) is such that the local population does not often have an opportunity to send a signal about its type. The local population observes the firm's failure to compensate it, and only then decides whether to incur the cost of protesting. Thus, the context diverges from a traditional bargaining model. If the local population had the opportunity to send a signal to the firm, it would indeed wish to convey it was the type to engage in protest if it could credibly do so. Figures 2 and 3 convey the extreme sets of beliefs (μ) where the local population never protests, or always does. It is only between those extreme values of the beliefs about the likelihood of repression that it would make sense for the local population to misrepresent its type. However, behaviors available to local populations that would constitute costly signaling are difficult to imagine. Indeed, many local populations voice demands of the firm, but the consequences for voicing these demands are minimal and consequently, so are the costs. Thus even those local communities with high costs of protest are likely to vocalize dissatisfaction with firm behavior, ensuring such a signal amounts to little more than cheap talk.

The firm, on the other hand, is able to convey some actionable information about whether the government will repress if it reneges, but only to the extent that the local population can update its belief about the likelihood of repression from the firm's decision (consider the semi-separating equilibrium in the Appendix). The only context in which the firm is potentially better off when the local population protests is if the government will repress a protest, which would in turn, make the local population less likely to protest. Thus the firm would wish to renege in order to lead the local population to believe the government will repress, even if that is not the case. In fact, the firm would only ever renege if the government would enforce its promise if it does not believe protest is sufficiently likely. This would look much like the scenario in which the firm observes the local population's beliefs about repression to be high, but it doesn't know if they are high enough to deter protest. Thus, the firm (and the government for that matter) might wish to manipulate the local population's belief about the likelihood of repression in order to make it less inclined to protest.

Discussion and Conclusion

In this paper I have constructed a model that helps us to unpack the strategic considerations of the actors involved in and impacted by resource extraction – firms, governments and local populations. The model and its analysis are motivated by the post-1990s context, in which firms under pressure from international institutions and the norms they perpetuate make explicit promises regarding the provision of some compensation or benefits. However, this begs the question of whether this is a uniquely post-1990s phenomenon. The formality of an explicit contract is indeed a reflection of the growth of international institutions governing firm behavior,²⁴ and the emergence of networks for monitoring firm behavior.²⁵ However, this says little of the incentives for such behavior before the presence of these normative pressures. Did firms engage in this kind of strategic goods provision, and did government calculations about such engagement resemble the incentives presented here before the emergence of a set of international norms and expectations about firm behavior in host countries, or other non-state actors with whom the government might interact on similar terms?

Unfortunately, observing historical instances of the contracted outcome is difficult for two reasons. First, a general conclusion from the model is that the conditions that make the adhere outcome likely are more restrictive than those resulting in all other outcomes. Consequently, empirically we should expect to see more instances of acquiescence, government upholding the contract, and subdue than of the adhere outcome. Second, a significant selection bias has led much case work to focus either on instances in which firm failure to mitigate the consequences of extraction results in protest and repression, or the transformation of such protests into insurgencies, secessionist movements, civil wars. The point at which such cases enter into historical record is usually at the point of protest. We need only consider the title of Klare’s book, “Resource Wars”, the edited volume “Resource Rebels”, or the frequent references to the case of Bougainville or the Niger Delta to observe a tendency to focus on the more violent outcomes. The outcomes of adhere and aquiesce are examples of the “dog that didn’t bark”. As a result, we have little empirical record.

Indeed much of the case work available concerns the late 1980s and 1990s, just as a wave of privatization divided the endeavor of commercial extraction from that of governance by the state. However, throughout much of the 20th century, the formation of ‘company towns’, where workers resided and were provided with social services such as education and medical facilities, allowed firms to maintain a stable labor supply. Notably, in socialist

²⁴Jones Luong (2014)

²⁵Indeed, there is nothing about the model that suggests that the explicit statement of the promise is necessarily a declaration of intent, and such a statement may better be seen as an useful tool for understanding the sequence of play and the timing at which certain information is known.

Africa, the firm was an extension of the government, and thus the incentives of the firm and state collapsed into those of a single administrator. But whether such incentives exist for non-state actors to provide goods to local populations is, in some respect, a question about the historical development and maintenance of a state capable of broadcasting power by way of regulatory enforcement across its territory, given that firms operate in the state's shadow of hierarchy.

Foreign investment in the extractive sector has primarily consisted of (up until quite recently) the hosting by resource rich countries in the global south of firms based in capital rich countries of the north. When such kinds of investment began (in the form they take currently), many developing states share the characteristic of limited state capacity, and as Herbst points out, the broadcasting of power over African states in particular has remained limited. In fact, many states invited FDI for the very purpose of increasing state resources, preferencing capital accumulation, much of which was extracted in regions relatively distant from the political center. In extractive colonies throughout the 20th century, repression was particularly brutal because the repressor experienced few (if any) political costs to doing so. Particularly where (and when) political costs of protest to governments are limited, such as in closed autocracies, the density of the local population is likely to matter. But even where local populations were capable of interrupting the revenue stream from the resource (given underdeveloped infrastructure for its transport), the repression of such populations in order to protect the resource has historically carried fewer domestic political costs. Countries that consolidated with significant natural resources developed repressive capacity at the expense of regulatory strength in these regions.

However, those governments with preference of capital over political support in the development of a state are not only an historical phenomenon. Downey et. al. (2010) provide some evidence of the model's mechanisms at work, finding that governments are indeed more likely to use repressive tactics to "support capital accumulation" related to resource extraction. They find that repression occurred against local populations protesting around mining sites of major minerals in South Africa, Mongolia, Malaysia, China, Brazil, Tibet, Sierra Leone, Indonesia, and Papua New Guinea in the last 15 years, with forced removal of local populations in countries such as South Africa, Brazil, Sierra Leone, and Kenya. Furthermore, the forced eviction of the Dayaks in Indonesia for the development of a gold mine was accompanied by repressive tactics meant to convince the villagers of the consequences, should they protest. They conclude that "developing nation governments may ... use all means necessary to protect resource extraction activities so as to meet their debt obligations, ensure continued foreign investment, and minimize conflict with more powerful

nations and institutions.”²⁶

Several cases highlighted by Downey et al. (2010) demonstrate that protestors make use of the mining infrastructure to interrupt extraction. In China in 2005, protestors blockaded the entrance to a manganese mine to protest contamination of the water supply. In Brazil in 1998, local residents blockaded the road accessing a development parcel near a newly developed iron ore and manganese extractive site. In these cases, and indeed the case of Tete Mozambique discussed in the introduction which I revisit here, the natural resource constituted significant revenue potential for a government in a region with limited infrastructure.

Recall that the local population affected by Vale’s coal mine protested, interrupting the transport of coal to the port by barricading the railroad, but the local population affected by Rio Tinto’s coal mine nearby did not. The comparison of two enclaves of the same resource, within the same region of the same country allows for several of the parameters to be held constant while illustrating the importance of the actors’ beliefs, as well as cost of the transfer and the political relevance of the local population for explaining the different outcomes. First, Rio Tinto was able to update its belief about the local population’s cost to revolt, having observed the protests in Vale’s concessions. Rio Tinto, having invested later than Vale had the opportunity to observe the protest in the Vale’s concession, ensuring that it followed through given its updated understanding of the likelihood of protest. Second, the cost of the promised transfer was higher for Vale, since the number of people in the Vale enclave that directly relied on the natural environment for their livelihood and would require resettlement was twice as large as it was for Rio Tinto. Finally, the local population was of particular political importance, as Mozambique’s ruling party, FRELIMO sought local legitimacy as it campaigned for elections to the national congress, to be held later that year. The political costs of significant repression relative to enforcing the contracted agreement were particularly high, leading them to compel Vale to honor its initial commitment to residents in Cateme.

The model outlines conditions under which a non-state actor, in this case an extractive firm, has incentives to engage in the provision of goods and services in a defined region. It also outlines how a government can benefit from ensuring that the firm does so. The infrastructure required for extraction and the locational rigidity of the asset make the firm vulnerable to protest by local populations living in the region. The government recognizes this, and though it may lose out on revenue it collects from the firm in the event of protest, it has the added calculation of the effect of protest on its political support base. Under the assumption that the government has limited and finite resources, it can take advantage of

²⁶Downey, Bonds and Clark (2010) pp. 424

firm presence in these areas since it can be less costly for the government to compel the firm to provide goods and services than to incur the costs of protest should they not be provided. The government can thus leverage the potential costs of protest to the firm in order to garner regional support resulting from goods provision in the region. As the model indicates, a government's capacity to do so depends on the relative costs (monetary and political) of protest to and each actor's beliefs about each other.

Chapter 3

Firm as Governor?

Tracing the effect of firm presence on local governance outcomes in Mozambique, Zambia and DRC

In 2009, more than fifty-five percent of the US\$890 million in foreign direct investment in Mozambique went to the extractive sector, in large part to begin development of the coal deposits found in the northwestern province, Tete, a region of historically limited and contested state presence.¹ Foreign extractive firms bid on concessions in which to build open pit mines to extract the coal. Two firms received adjacent concessions and began construction of open pit mines to access the coal seam. Both projects required the resettlement of thousands of local residents and created strains on resources required to sustain their livelihoods, leading the firms to make promises to compensate residents. However, in one of the concessions, local residents barricaded the rail line that delivers coal from the mine to the port to protest mining operations. In response, the government compelled the firm to provide the promised goods and compensation to the local population, exerting regulatory enforcement where there had been limited engagement by the government. In the other concession, there was no protest, and the government did not directly intervene in the firm's concession.

The vignette suggests the following puzzle: why do we observe variation in the effect of firm presence on local governance outcomes? In the story above, firm presence led to increased government allocation of resources for the enforcement of regulations pertaining to firm behavior in one coal concession, but not in the other. The puzzle becomes more stark, if

¹Alexander (1997); Coelho (1998)

we consider a similar comparison of copper concessions in Zambia, where the government has engaged in localized regulation of firm behavior, and DRC, where the government maintains a strong, and repressive security presence which has in part, been co-opted by extractive firms. Why and when do governments increase local engagement as a result of firm presence, and why does this take the form of security governance in some regions, and regulatory governance in others?

I will demonstrate that there is variation in how states react to and shape firm engagement in and around their sites of operation. I argue that variance in the effect of firm presence on local governance outcomes cannot be explained without consideration of the support of the population at the local level. The local population residing in and around firm operations is an important actor, and its interactions with the firm and government are the crucial interactions on which an explanation of local governance outcomes must rely. Both the government and the extractive firm, to varying degrees, require local support to continue to operate in their primary functions. However, while the procurement of support from local communities may help to maximize firm revenue, the goal of revenue accumulation for the government may in fact be in tension with the goal of obtaining political support at the local level.

Framing the Puzzle: Literature and Theoretical Foundation

One tempting framework for explaining this variation in governance outcomes is that of state capacity: different levels of state capacity account for the different local governance outcomes. Specifically, Herbst suggests that the way governments “broadcast power” (as Herbst (2000) and Mann (1984) call it) is the result of relative differences in government resources, and that these resources are deployed at decreasing levels in concentric circles emanating from the country’s seat of political power. This type of explanation has been a staple in state-centric approaches to understanding the way and extent to which government actors engage locally in goods provision, extraction, or regulation.² This literature has not directly or explicitly addressed the question of how the presence of firms affects these local outcomes. Nonetheless, a state capacity framework would suggest that the effect of firms on local governance outcomes would vary with government strength: firm presence should have one effect on local governance outcomes in states of significant capacity, and another in states of limited capacity. However, as this study will demonstrate, variation in governance

²Besley and Persson (2010), Scott (2004), Acemoglu (2005), Goldsmith (2001) are a few.

outcomes varies even within states of low state capacity, and across states with relatively similar resources. Consequently, this kind of observable variation necessitates local level analysis, or at the very least, analysis that is not defined by national boundaries.

Scholars like Boone (2003), have certainly engaged in local level analysis to understand how configurations of state power in rural regions depend at least in part, on the relative bargaining power of local elites, as shaped by the social structures underpinning their authority and capacity. I build on Boone’s work by focusing on the role of a non-state, local power broker: the firm. In the same way that states brokered deals with local elites in order to lessen the cost of state governance in these regions (often for the purpose of extraction), I will show that firms operating in similarly peripheral environments engage in the task of building local support in order to lessen costs of their operation. However, this engagement does not occur in the absence of an authoritative state entirely, but in the state’s “shadow of hierarchy.”³

The addition of the firm to an exploration of rural configurations of state power invites an alternative and equally tempting explanation for the puzzle at hand: the effect of firm presence on local governance outcomes depends on characteristics of, and constraints on, the firm (as opposed to the state, mentioned above). The observable outcome of this theoretical framework is that different firms are likely to affect local outcomes differently. It is certainly the case that firms have different cultural and management practices that shape their local engagement strategies.⁴ However, the literature on localized firm investment also suggests that a shift in norms in the 1990s yielded a collective movement toward social spending in regions of foreign investment.⁵ As a result of the generation of shared expectations about how businesses should behave at their operational sites, the literature argues that there has been a degree of codification, and even standardization of firm practices that has begun to minimize the variance of firm behavior. Taken together, these two strands of literature suggest that firm behavior is likely to be a function of individual firm characteristics that are constrained by a cascade of international norms about their local behavior. Yet, as I will demonstrate in this paper, local engagement by the firm varies even among the projects of the same firm, suggesting that, while firm characteristics including organization or firm culture may indeed vary within the international normative constraints, there is some part of the story that is still missing. Here too, consideration of local level factors, as authors such as Brousseau and Fares (2000) and Wolf, Deitelhoff and Engert (2007) suggest, can provide a more fertile level of analysis for why a single firm might affect local governance outcome

³Mayntz and Scharpf (1995)

⁴Waldman, Siegel and Javidan (2006), Hart (1995)

⁵Jones Luong (2014)

differently at each site of operation.

In sum, variation observed within a single country suggests that reliance on national level characteristics, and hence analysis at the level of the nation-state cannot account for variation of these outcomes within states. Variation within a single firm's operations is an additional justification for local level analysis and further explains why a focus on the local level is required to understand variation in the role of the firm in local governance outcomes. But local governance outcomes in extractive regions are the result of both firm and government behavior, and reliance on local support is relevant for understanding the incentives of both actors.

For firms, one might naturally suggest that local support is important because international norms create reputation costs for poor behavior by firms. However, reliance on international norms for constraining and shaping firm behavior requires that their local behavior and its consequences are internationally observable, or that there is an avenue for conveying information to international actors with sanctioning capacity. Furthermore, it assumes that firms care specifically about international reputation costs. While firms often have entire teams of personnel devoted to monitoring shifts in stock prices which might reflect this priority, the operational offices at the project sites are arguably concerned more with immediate threats to their operations (and the way these threats are expected to be dealt with by the state). These are the phenomena that may grow large enough to signal potentially sanctioning actors of poor firm behavior, but present a more immediate threat to firm production and personnel. The manifestation of this concern is conveyed through the frequent mention and discussion by firm community liaisons of the concept of "a social license to operate" obtained through "building local legitimacy" in and around the firm's sites of operation. The development of such an abstract license for most firms means a very concrete and material set of processes and tasks including holding local meetings, providing social goods and services, and mitigating any adverse environmental consequences of their operations.

There is significant literature including empirical studies that links corporate social performance with the overall financial performance of a firm,⁶ but more limited discussion of local discontent at operational sites, which is of particular concern for mining firms. Local support shapes firm strategies of local engagement, since loss of local support can result in local discontent, thus threatening the firm's existing and future production. Mining infrastructure is a fixed, sunk cost, and often requires few people to significantly affect firm operations by interrupting production. The barricading of the railroad in the Mozambique case is a useful example, as only a relatively small number of people were required to stop

⁶Griffin and Mahon (1997), McWilliams and Siegel (2000), Orlitzky, Schmidt and Rynes (2003) are a few.

coal production for a full day. Thus providing collective goods to local residents as a way to secure support is likely to be less expensive than identifying those that are likely to engage in sabotage, and continue to provide private goods to them. Additionally, the average duration of a mine is approximately 30 years, making the provision of collective goods and the mitigation of environmental consequences less costly in the long run than identifying individuals that are particularly unhappy and providing individual private goods. It also has the added benefit of mitigating the response by local residents to accidents or firm behaviors that unintentionally harm local communities. To be sure, we do observe the provision of private goods to local leaders at earlier points in the extractive process, where local chiefs often serve as immediate gatekeepers to land for prospecting activity. But the continued provision of a set of compensatory goods to the local population is likely to contribute to a durable acceptance of firm operations over the course of a mining operation, where infrastructure is particularly vulnerable. Building local support is an explicit form of risk management for firms.

My aim is not to explain why a concern about local support for firms emerged, but the historical context is useful for understanding how firms have come to associate costs with the failure to obtain it. Our collective understanding of the governance outcomes around natural resource extractive sites is the result of reported, and generally violent, individual outcomes (Bougainville, Niger Delta, etc.) - consider the book “Resource Wars”⁷ in which natural resources, both in abundance and scarcity, lead to violence. In many of these cases, governments are assumed to have rentier motivations, and firms act as a sort of “spaceship extractor,” which arrives to extract a resource with minimal engagement in the local, social, context. While the historical record of local governance outcomes is littered with cases of the dog that didn’t bark (governments did not engage locally or their engagement led to non-violent outcomes which did not call the attention of scholars or the media), this skewed record has lent validity to the belief that failing to obtain legitimacy at the local level for firms has the potential to carry significant costs.

But if this is the case, why would all firms not engage in a strategy of local support building, in and around each and every one of their operations? As the opening sketch suggests, firms vary in the extent to which they do so. One reason is that the costs of this support differ in each operational context. For instance, some local populations are more reliant on the natural environment for livelihoods, and thus ensuring they are not adversely affected by firm presence may be more costly than in other environments. Firms must weigh the long term value of local support against the cost of obtaining it. This calculus depends in part on the firm’s expectations about the likelihood that the affected local population will

⁷Klare (2001)

actually engage in behavior, including as protest or sabotage, that imposes costs on the firm (in addition to the actual cost of this behavior to firm production). These costs are shaped by the way that the government responds to the outcome of the firm-population interaction. So while the idea of local support shapes firm's perceived costs for different strategies of local engagement (i.e., invest in building local support or don't), the firm-population interaction cannot be considered in isolation from existing and historical state engagement in the region.

Local configurations of the state are also important for understanding why, even in the absence of firm efforts to build local support through the provision of a combination of public and private compensatory goods and mitigation of environmental consequences, local residents may still decide not to engage in resistance against the firm. Observably, the uninterrupted operations of a firm may be the outcome of local support or just a failure to protest on the part of the local population (a sort of mere acquiescence). Local populations may decide not to protest either because the firm has obtained acceptance for their operations, or because the local population's fear of government response to resistance deters them from doing so. This latter outcome is the result of local acquiescence, as opposed to actual acceptance or legitimacy of the firm's activities. Thus the local governance outcomes I am concerned with cannot only be explained through analysis of the interactions of the firm and local population, but must also include the existing and historical role of the state in the region.

Local support building through firm provision of goods occurs in extractive regions that are often far from the political center of the country, and tend to be regions of more limited state capacity. Such regions are not uncommon on the African continent where the cases in this study are located. As noted earlier, Herbst's concept of concentric circles of power underpins the notion that the state may be little more than a cultural reference point by way of the leader's cult of personality, rather than a practice, derived from real consideration of the state as a legitimate source of social ordering and goods provision. Consequently, these regions are often regions of legitimacy deficits, wherein the institutions of the state are of questionable relevance for local access to resources (political or otherwise). Yet as Boone, and more explicitly Pitcher (1996), points out, the state does engage in local power brokering with the goal of building legitimacy since, as North explains, "the costs of maintenance of an existing order are inversely related to the perceived legitimacy of the existing system." (1981:52)

I acknowledge that differentiation between efforts to build political support versus state legitimacy presents a significant empirical and theoretical challenge. State incentives are often more immediate than the consolidation of the state through building long-term legitimacy in a sparsely populated region far from the seat of power. In particular, strategies of

state engagement in a region are likely to reflect the immediate demands of political support for the continued survival of a leader or the importance of the revenue potential from the region. However, in regions of limited state presence, building political support in order to contribute to the government's support base is also, in fact building legitimacy in the state as a local actor, regardless of the party or leader in power. Thus regions of limited state presence, are likely to be regions wherein populations are skeptical of the state, and thus the consequences of government response to firm behavior and local resistance are likely to have longer term effects. My aim is not to assess the relationship between short-term political support building and longer term legitimacy building, only to make explicit the assumption that in regions of limited state presence, strategies of achieving these two goals are unlikely to be significantly different.

How might government behavior in these extractive regions of limited state presence translate into political capital? Governments may respond to immediate demands to build support by making public attempts to claim credit for attracting the firm to the area, thus benefiting from the firm's provision of goods in the region without incurring the costs of providing them. In the event that local communities protest the firm's behavior, government repression may carry with it costs to its support base (as is evident in much of the repression literature⁸). Alternatively, government regulation and enforcement of firm behavior and promises to provide compensation, often in the form of welfare goods and services, can increase its support in the region. While this is admittedly a crude differentiation and dichotomizing of government behavior, these strategies capture the essentialized behaviors that reflect the way a central government manages tradeoffs in a locally defined context.

I contend that regions of natural resource extraction constitute strategic contexts, in which the interaction among extractive firms, local populations and governments is compelled by the presence of the resource and territorialized by the concessionary allocation of extractive rights. Extractive regions, which are often far from the political center of a country but which hold significant revenue potential, compel extractive firms to engage with local populations in order to secure access to the resource and continued extraction. But the state's revenue-driven interest in the region ensures that it too experiences costs should the firm fail to secure the support of the local population. Instances of sabotage and protest, which local residents might engage in if grievances about extractive externalities or exclusions from economic benefits can interrupt firm operations, and the monetary costs of interruptions accrue to both the firm and the government. However, should the local population engage in contentious behaviors, the government also faces potential political costs, depending on how it responds. Government repression may carry with it costs to its

⁸Davenport (2007)

support base, while a government decision to compel firms to secure approval by providing compensation, often in the form of welfare goods and services, can increase its support in the region. Consequently, I argue that the support of local populations matters for understanding different governance outcomes, but I will show that the way in which it matters is shaped by the actors' beliefs about each other. The relevance of these beliefs is constrained by the costs of obtaining local support relative to the costs a local population can impose on firms and governments by protesting, and their political salience to the central government. These outcomes of localized firm investment, resistance by local populations, and government response are manifestations of a menu of governance strategies in a region where monetary and political resources create significant, territorialized tradeoffs.

The following comparative case analysis will show how these strategies unfold, and how their manifestation on the ground reflects the preferences and perceptions of the actors. I link outcomes of firm investment, resistance, repression and regulation by showing how they reflect the strategic considerations by the actors in and around extractive sites. I qualitatively assess the effect of firm presence on governance outcomes in two comparative contexts: within the same country, and among concessions of the same firm. Drawing on interviews, firm documents and reports, and participatory observation, I show that understanding why there is variation in the effect of firm presence on governance outcomes requires local level analysis of the costs of relevance at the local support. Specifically, I demonstrate how pursuing local support drives firm and government behavior when the costs of doing so are not too great. These costs are determined by firm beliefs about the likelihood of protest, the actual monetary cost of protest to the firm and government and the perceived cost of securing support from the local population. However, for the firm, the government response to a protest shapes the firm's cost of failing to secure local support. For the government, a response is dependent on the relative tradeoff between the potential political costs or gains to repression or regulatory enforcement.

Mineral Extraction and Local Investment in the African, post-1990s Context

Privatization of state owned enterprises accompanied structural adjustment in Africa in the 1990s, which lead to significant growth in foreign direct investment to the extractive sector. The chronology of firm investment in the extractive sector in most African states (which continue to retain explicit ownership of all sub-soil resources, even once leased out to transnational firms) is relatively similar. The process may be divided into several phases: the

exploration and feasibility phase, the development phase, the operational phase, and mine closure. The government issues a call for firms to purchase exploratory permits and the winning firm sends geologists and engineers to assess the presence, grade, and value of the total reserves of the resource. Following this exploration, firms develop feasibility plans for the extraction of the resource, and bid for the rights to extract the mineral from a predefined concession. It is important to note that junior firms regularly conduct the exploration, while senior, larger firms with more significant capital reserves bid on the contract to develop the concession. Once a firm's bid for rights to extraction is accepted by the government, the firm assesses the effects of its planned operations through the development of an Environmental Impact Assessment (EIA).

The transnational spread of EIAs, as well as general investment in socially and environmentally responsible practices resulted from the emergence of a set of norms and guidelines for the conduct of private foreign and transnational firms in host countries. Jones Luong and others trace the emergence of these norms, which have been codified by the World Bank.⁹ These guidelines pertain to the conduct of firms with respect to the rights of local populations in their region of operation, including management of resettlement of local populations and the adverse effects of firm operations on these populations. EIAs are conducted by independent contractors who survey the potential environmental and social effects of the firm's planned operations. EIAs are contractual agreements that must, generally, be approved by a government ministry in order for the firm to proceed with mine development and operation. If the concession encloses an existing local population, the firm also contracts out the development of a Resettlement Action Plan (RAP).

While EIAs and RAPs are contractual documents specifying the costs of managing the local environmental and social effects of mining operations and related firm responsibilities, and thus carry the full weight of government enforcement, firms are also expected to invest voluntarily in local economic development in the regions in which they operate. Discretionary spending regularly falls under the title of CSR, and firms report these investments in their annual financial and sustainability reports. The belief that extractive firms need to invest locally to obtain a 'social license to operate' is prominent across most extractive firms, and this incentive is well understood even by those outside of the industry. One mining executive indicated that he and colleagues from other firms "developed some approach to social responsibility, because [they] know that unless [they] help that local population, [they] are never going to improve [their] own production rates."¹⁰ These investments include

⁹International Finance Corporation, World Bank Group (2012), International Finance Corporation, World Bank Group (2002), World Bank Group (2009)

¹⁰Aravat (2012), Svendlund Private Interview (2012)

construction and staffing of schools and medical clinics, sports clubs and venues, educational outreach and scholarship provision.

While this is discretionary spending, in comparison to the spending stipulated and required by the EIA and RAP, it is often impossible for local populations to differentiate between CSR and EIA/RAP. Local communities are often uninformed about the difference between rules shaping these kinds of investments, and there is significant overlap between the goods and services that the EIA/RAP requires as compensation and those that firms choose to engage in to constitute CSR. Firms often make promises about the potential benefits and local effects of the mining project to the local communities in what are called “shareholder meetings.” However, many local populations are often largely unaware of the extent to which these promises are backed by the contractual agreement of the EIA/RAP or whether they are a part of voluntary CSR, and as a result cannot differentiate between the two practices. Furthermore, many firms see the stipulation and superficial fulfillment of these assessments and plans merely as “box ticking” exercises.¹¹ In addition to the provisions stipulated in the international guidelines and the resource extraction contract with the government, firms also make extra-contractual decisions about the existence and size of transfers to the local population. As a result, the total package that extractive firms offer varies, and varies independently of stipulations for social and environmental spending in the contract. This is the context in which the following case studies of natural resource extraction are situated. I now turn to the case of coal extraction in Mozambique to understand subnational variation in governance outcomes in regions of natural resource extraction.

Coal in Tete, Mozambique

Significant coal reserves were discovered in northwest Mozambique in 2006, including perhaps the largest reserve of high grade coking coal in the world. Known reserves in the northwestern Tete province are about 23 billion tonnes,¹² and the coal seam has attracted tens of mining companies. The largest mining licenses were given to the Brazilian iron company Vale for its Moatize Project and to the joint venture by Riversdale and Tata for its Benga Project (now owned by Australia’s Rio Tinto). Vale and Rio Tinto conducted EIAs and completed RAPs, as villagers lived within the concession boundaries and required relocation for the firm to begin construction of the mine and extraction of the coal.

The two firms’ engagement in the region had different outcomes: the villagers relocated by Vale protested the firm’s activities, barricading the railroad and interrupting the transport

¹¹Davies Private Interview (2012)

¹²Centro de Promoção de Investimentos (2011)

of coal from the mine to the port, while Rio Tinto was able to avoid this kind of costly resistance. Furthermore, while the government retained a limited state presence in the region after allocation of coal licenses, it intervened to enforce promises made by the firm to the residents near their operations. In what follows, I first describe the different governance outcomes in the two coal concessions in Tete. Then, I explore how firm expectations and costs to obtaining local support through goods provision shaped their initial investment strategy. I then discuss how the state's historically limited claim to legitimacy and timing of the protest shaped the government's engagement.

One resource, one country, two outcomes

Brazilian iron ore company Vale was one of the first firms to invest in coal in Tete Province, developing its feasibility report in 2008. Its Moatize coal concession is about 17 km northeast of the city of Tete, the provincial capital, with rights to extraction for 35 years. Shortly after Vale began construction of the Moatize project, Riversdale (later Rio Tinto) obtained a license for the development of the nearby Benga concession with leasing rights for 25 years. The Benga project is just west of Vale's Moatize project 14 km southeast of Tete City and 7 km southwest of Moatize, bordering closely the Revuboe River. The proximity of the two concessions ensures a shared historical and environmental context.

On December 20, 2011, local leaders in Cateme, a village of residents resettled by Vale for the construction of its mine, addressed a letter to Vale and the local government enumerating the complaints that members of the resettlement had concerning the structure of the new houses, limited access to arable land, a market, and water. They stated January 12 as a deadline for those requests to be met.¹³ When January of 2012 arrived, more than 500 families gathered at the railroad to block the passage of trains carrying coal from Vale's mine at Moatize to the port of Beira. In total three trains failed to reach the port as a result, each train had about 42 wagons, and carried about 2500 tons of coal¹⁴ (over a US\$1million loss in one day).¹⁵ Protesters claimed they were barricading the railroad because of the failure of Vale to carry out a promised resettlement package when they were moved to the town of Cateme to make way for the new coal mine in Moatize. They accused the firm of

“...downgrading the quality of the houses by not sticking to the model house design that was negotiated with the government and shown to communities. The quality of the houses is also not what was promised ... the communities also claim that other pledges - such as paved roads, running water, ambulances, land for farming and employment - have not been

¹³Rodriguez (2012)

¹⁴Campbell (2012)

¹⁵Resenfeld (2012)

fulfilled.”¹⁶

Those resettled in Cateme complained about the lack of foundation in the houses, the poor quality of land in and around Cateme (relative to the old village), the greater distance to the markets and (limited) government provided services (the new settlement was more than 40 km from the nearest market) and insufficient grazing grounds.¹⁷ Furthermore, Vale promised two hectares of land per family, only one had been allocated and while the firm had provided food aid briefly during 2009 and 2010 given the interrupted harvest season, it failed to do so after 2010.¹⁸

In response to the January protest in Vale’s concession, a rapid response team arrived, resulting in the arrest of fourteen people (nine were held for two days). Production and transport of coal was restored within twenty-four hours.¹⁹ Caught off guard by the protest, the district level government refused to address questions about the protest in a press conference. While Vale did not make a public statement about the protest in and around the Moatize site, it did issue a formal response to a report conducted by a regional NGO about the effects of mining on communities in Tete.²⁰ Though the initial response from the government to the protest was minimal, in the aftermath, the government compelled Vale to address the complaints. Less than a month after the protests, the head of the local government’s “Tete Provincial Resettlement Commission” changed the required specifications on the houses. According to firm employees, the commission was of limited local significance up until this point (one did not even know it existed).

As a result, Vale resumed the delivery of food aid to Cateme in March, two months after the protest by Cateme residents²¹ and engaged in a publicized campaign to fix the houses. Six months after the January 2012 protest, Vale signed an MOU with the government of Mozambique and representatives of the two resettled communities, which includes, according to Vale, approximately 40 commitments to maintain infrastructure in and around the villages. Since the demonstrations, Vale worked to renovate the houses in Cateme as well as in its more urban region including fixing flooring, roofing, wooden frame, and electrical wiring, on over 80% of the houses in Cateme, and just under 15% of the houses in 25 de Setembro, where other residents from the concession had been resettled.²² Furthermore, on December 11, 2012, the government publicly stated that mineral revenues would be directed toward the community of Moatize, in 2013. They are to receive 2.75% of revenues, amounting to

¹⁶Kabemba and Nhancale (2012)

¹⁷Mosca and Selemene (2011)

¹⁸Human Rights Watch (2013)

¹⁹*Mozambique: 14 People Arrested in Moatize Protests* (2012)

²⁰Human Rights Watch (2013)

²¹Human Rights Watch (2013)

²²*Mozambique: Vale Renovates 576 Houses in Cateme* (2013)

approximately US\$1million.²³

In the nearby Benga coal concession, Australian firm, Rio Tinto, was in the process of implementing its RAP. In the short-term, thirty-nine families that required relocation by Rio Tinto were to be temporarily settled in the town of Moatize, where the firm promised to pay rent, up to 250 kilowatt hours of electricity per month (generous relative to average consumption),²⁴ and up to 15 cubic meters of water per month. An announcement was made at a meeting with Rio Tinto and residents of Capanga, for whom the new requirements would be relevant that “Rio Tinto has promised the people, the Provincial Resettlement Commission and the Moatize District Government that it will comply with the agreements it has reached with the Capanga population and with the government” and that the population had agreed to the proposal.²⁵ Residents in Rio Tinto’s Mualadzi received a monthly package of dried fish, maize, flour, rice, cooking oil and soap from Rio Tinto as of early 2013.²⁶

In sum, the two firms were awarded adjacent coal concessions, however, their engagement in the region had different outcomes: the villagers relocated by Vale protested the firm’s activities, barricading the railroad and interrupting the transport of coal from the mine to the port, while Rio Tinto was able to avoid this kind of costly resistance. I will now discuss the firm’s beliefs and the costs of securing local support to explain this initial difference in firm strategy.

Local Support: Firm costs and expectations

The costs to obtaining support and the firms’ beliefs about the consequences of failing to do so shaped the firms’ strategies in their concessions. In this section I elaborate the promises that firms made to local population to demonstrate that firms did in fact aim to obtain local support initially. I will also show that fulfilling these promises was costly for both firms, though more so for Vale than for Rio Tinto. However, because Rio Tinto was able to observe the consequences that Vale faced when it failed to fulfill those promises, it was able to update its beliefs and expectations about the likelihood that their operation would be threatened if it failed to fulfill its promises.

Before the events of January 2012, both firms made explicit promises to local residents about the compensation that would be provided, and the steps that would be taken to mitigate the adverse consequences of extraction. These promises were communicated, as is often the case, in several “stakeholder meetings” in order to obtain buy-in from the local

²³Salemene (2013)

²⁴Based on Bensch, Peters and Schraml (2010)

²⁵*Mozambique: Tete Govt Changes Resettlement Strategy* (2012)

²⁶Human Rights Watch (2013)

population. Vale's resettlement process for the Moatize mine occurred between November 2009 and April 2010, and included the relocation of over 5000 people. Those relocated included members of the Chipanga, Bagamoyo, Mithete, and Malabwe villages, and resettled villagers were split up into two populations: approximately 700 households were considered rural and resettled in the village of Cateme, approximately 40 km from the town of Tete, while the other group of approximately 600 families were considered urban and resettled into a neighborhood in the town of Moatize.²⁷ Vale's community relations liaisons made promises to those relocated residents that they would receive compensation,²⁸ including water pumps at each house, refurbishment of a primary school as well as a hospital, and the construction of housing for those families (269) that were relocated to the outskirts of Moatize. For those families relocated to the rural settlement of Cateme, new houses, neighborhood pumps, an elementary and secondary school, health clinic, and two hectares of farmland. For a third group, the firm promised financial compensation in order to purchase new housing.²⁹

In comparison, Rio Tinto's Benga project required the resettlement of 679 families from the Capanga, Benga, and Nhambalualu villages. The Australian firm planned to resettle 588 families to the village of Mualadzi,³⁰ adjacent to the village of Cateme and another 75 families in more urban areas (though the exact location is not specified in the firm's Resettlement Action Plan).³¹ The resettlement and compensation plan that was expected to take approximately two and a half years to complete, was developed by Riversdale, whose license was later bought out by Rio Tinto. At the time of the acquisition, Riversdale had already built over 100 of the houses and begun resettling residents in the nearby villages. However, Rio Tinto was bound (both legally, and by way of the deterring cost of conducting another RAP) to carry out the plan developed by Riversdale, and according to a representative at Rio Tinto, began an analysis in 2012 to identify any gaps in the two entities' plans for resettlement.³² The firm promised the resettled residents of Mualadzi new houses, a primary school, two hectares of land per household, and several water pumps. Similar to Vale, Rio Tinto also promised those non-farming households financial assistance in purchasing a house in or near Moatize or Tete.³³

These promises, and particularly their communication to the local residents demonstrated that the firms made some effort to adhere to international norms and guidelines

²⁷Mosca and Selemene (2011)

²⁸According to NGOs, the company's EIA, and a letter from members of the local population relocated to the town of Cateme.

²⁹Consultec Consultoria Associados, Diagonal Urbana and ERM Brasil Ltda (2006)

³⁰Mosca and Selemene (2011)

³¹Golder Associates (2009)

³²Human Rights Watch (2013)

³³Golder Associates (2009)

regarding stakeholder involvement. However, the cost of fulfilling these promises, and thus securing a social license in the area was shaped by the environmental context in which the firms were operating. The operations of both firms disrupted the livelihoods of residents in the concessions and the cost to compensating them increased as competition over land grew as a result of concessionary license allocation. Residents in both concessions relied on small plots of land and access to water for the harvesting of maize and other staple crops, as well as the proximity of the towns of Moatize and Tete for selling these crops. Both firms were constrained by the limited availability of land for the resettlement of the local population (in fact water and land availability in Tete was a problem even during the 1980s).³⁴ The many small rivers are empty during the dry season, and droughts are common throughout the year. Additionally, pockets of fertile soil are scattered sparsely throughout the province.

While limited land and fragile water resources characterized the concessions of both firms, it was particularly constraining for Vale, who had many more families to relocate from its significantly larger concession (240km²) than did Rio Tinto (50 km²). As a result, the cost to fulfilling all requirements of the resettlement action plan to the firms differed as many more villagers lived in Vale's concession than in Rio Tinto's. The actual monetary cost to Vale was expected to be approximately US\$40 million³⁵ while the initial estimated cost to Rio Tinto for resettlement was estimated to be US\$26.1 million,³⁶ making honoring the promise more costly for Vale.

It might be argued that Vale made all attempts to honor its promises, and that protest was a result of grievances of the local population that would have erupted regardless of the strategy of resettlement and amount of local investment. To be fair, Vale acknowledges that it is not in the business of local development and as early as 2011, the firm recognized that improvements were required on some of the infrastructure in the new settlements.³⁷ It claimed that it had already begun to repair homes, maintain drainage systems and roads. Additionally, the firm indicated that the government altered the agreement, requiring that Vale compensate the families financially, in place of allocating a second hectare given the emerging land scarcity as a result of the multiplying concessions.³⁸ However, the firm's intent is evident in the failure to provide foundations for the houses it built. Residents claimed that the firm presented different model houses, with foundations, than those that were actually provided.³⁹ Vale miscalculated the likelihood that the costs to failing to secure a social

³⁴Coelho (1998)

³⁵Consultec Consultoria Associados, Diagonal Urbana and ERM Brasil Ltda (2006)

³⁶Golder Associates (2009)

³⁷Vale (2011)

³⁸Human Rights Watch (2013)

³⁹While Vale does employ several contractors and thus it might be argued that this failure was an oversight by the contractor building the house, the failure to monitor the construction by the firm, and the presentation

license would actually be realized.

At the start of mine construction, the firms did not expect to face resistance - they had no historical experience in the region that could shape their beliefs about the likelihood of pretest. In a report by Riversdale to investors in 2010 (before the site was acquired by Rio Tinto and before the protest in Cateme), key risks did not include any mention of resistance by the local community living in the concession.⁴⁰ But a Rio Tinto employee claimed that once the protest against Vale occurred, he began to worry about the potential for protest by the residents of the firm's resettled communities, and noted the importance of avoiding Vale's strategy.⁴¹

The actual costs of the Cateme protest amounted to approximately US\$1 million, which was not significant, though this is approximately the amount that Vale expected to spend on community investment during 2009.⁴² However, it demonstrated the potential for much greater revenue costs once production was maximized. While some sources suggest that the residents of Cateme were protesting against the firm, while others indicate the protest was against the government)⁴³ the limited infrastructure presented an opportunity for local populations to impose costs on both, regardless of the target (as Scott⁴⁴ would suggest). In this way, the fixed nature of the industry ensured that sabotage did not require targeting of the firm or the government specifically in order to impose costs on both. As a result, Vale began construction of a US\$5 billion railroad from Tete to the port of Nacala through Malawi, in partnership with the government of Mozambique,⁴⁵ and Rio Tinto has proposed an additional new rail line and a deep-water port at Macuze to mitigate these risks as well as reduce the transportation bottleneck.

In sum, both firms were aware of the consequences of their operations on the residents in their concessions. The effects are detailed in the EIA and RAP of each concession and dictate the promises made to the residents. However, Rio Tinto was able to observe how the local population would respond if the firm failed to adequately provide compensation that was promised. Rio Tinto was still in the midst of its relocation process when it observed the first protest in Cateme. As a result, it was particularly wary of the likelihood of protest, should residents be unhappy with its resettlement and compensation provision. Consequently, Rio Tinto delayed resettlement, ensuring that its houses were better constructed, that collective

of a model that was different from those that were eventually built suggests more than an oversight.

⁴⁰Local discontent and violence for surrounding communities is a risk that is explicitly noted in mining project internal documents

⁴¹Interview (2012a)

⁴²Vale (2009)

⁴³Campbell (2012)

⁴⁴scottwow

⁴⁵Resenfeld (2012)

farming projects were underway, and even that the utility poles erected to carry electrical current were in better condition to ensure it avoided potential interruptions.

Government tradeoffs: Frelimo, political support, and revenue

The government's perception of the potential value of the industry in the region weighed against the timing of the protest to the government's response the way it did in a region of traditionally limited state presence. Both the Vale and Rio Tinto coal concessions presented significant revenue potential for the government, which was potentially at risk from events like the Cateme protest. Tax revenue was expected to reach US\$700million per year when production was fully underway.⁴⁶ In 2010, the Mozambique Coal Development Association reported that the Moatize project resources were about 2,286Mt,⁴⁷ but the first 35,000 tonnes of coal didn't leave Vale's Moatize mine until in August 2011, traveling the 575 km by rail to the port of Beira.⁴⁸ In 2010, the natural resource sector contributed only US\$11.4 million to the national budget, and though in 2011 it was approximately US\$24 million (a nearly %100 increase, in comparison to energy production, oil exploration and "other" which saw significant decreases), it was still only a small fraction of its potential capacity.⁴⁹ In spite of this significant potential, significant revenue streams had yet to be reached at the time of the protest.

The revenue potential of Tete, and the Moatize and Benga projects in particular, was countered by the political salience of local support at the time of the protest. The northwestern province of Tete is historically a region of limited, and contested state presence. Post independence, the Frelimo government engaged in a development strategy that entailed the villagization of rural Mozambique resulting in the resettlement of peasants into villages and the transformation of the means of production into collective farms. The current district of Moatize saw one of the largest concentrations of villages. In the push to develop the communal villages in the 1980s, villages were developed far from the provincial capital, without sufficient transportation infrastructure, which limited state presence. Because Tete was a "backward province based on household agriculture", there was minimal state investment.⁵⁰

Legislation in 1994 called for a stronger role for traditional authorities and a decentralization of government functions was expected to lead to greater state presence in peripheral provinces, like Tete. However one government official noted, "where there are no roads, there

⁴⁶World Bank International Development Agency (2013)

⁴⁷MinAxis Pty Ltd (2010)

⁴⁸African Development Bank (2012)

⁴⁹Ministry of Finance. Government of Mozambique (2011)

⁵⁰Coelho (1998)

is no government presence,”⁵¹ and perception had developed, particularly in rural areas, that authority was party based, and that, in effect, the party and state were synonymous. Still, the law devolved control over social welfare, education, roads, health, development, environmental protection, land management, public and private markets, to an elected administrator and assembly at the district level. The role of “traditional authorities” included “maintenance of harmony and social peace”,⁵² management of land, tax collection, secondary road management, and Frelimo officials wished to pay chiefs for doing so, ensuring they acted more like enforcers than independent representatives of local communities. Indeed, it is reported that Frelimo representatives held high profile meetings with chiefs of regions in which government presence was weak. Alexander (1997) notes that “for officials, chiefs seemed to offer a cheap, willing and apolitical means of extending state authority, and thus redressing the quandaries produced by multi-partyism and an inability to mobilize resources or labour by other means.” However, in spite of this, Coelho (1998) cites chronic state weakness in Tete, and the absence of any state sector beyond minor involvement in Moatize’s early coal industry.

As Pitcher (1996) has noted, Frelimo has historically sought opportunities to gain political legitimacy at the local level, though the region remained one in which might be considered a “legitimacy deficit”. Opportunities for building local legitimacy that she elaborates in the case of Mozambique’s cotton industry, such as Frelimo involvement in the day to day operations of the firm, were not available in the case of foreign coal companies, given the significant differences in industry structure and the absence of joint ventures. However, the protest at Vale’s concession provided just that opportunity, by allowing the government a clear regulatory role.

The context and timing of electoral politics ensured an increased focus on the importance of maintaining political order in Tete, and follows earlier work that describes how the party capitalized on opportunities to cement support at the local level. The majority (2/3) of Frelimo’s Central Committee as well as two-thirds of the congressional delegates are elected at the provincial level. The Frelimo congress was set to meet and elect the members of the Political Commission, the party’s central ruling body during 2012, when most of the events of interest transpired. Though Tete is a traditional stronghold for the ruling Frelimo party, the convergence of the provincial conference and party congress, and the local response to the firm’s resettlement and local investment strategies ensured that the government sought a resolution to the protests that was sustainable (at least in the short term), and for which it could claim some credit. One firm official in Tete explicitly noted

⁵¹Alexander (1997)

⁵²Alexander (1997)

that the government's decision to compel the firm to follow through was the result of the Frelimo party elections, claiming that the public directive toward Vale was the best way to maintain order while potentially building support.⁵³ Indeed, Frelimo did claim credit for attracting the firms to the region and the provision of housing and compensation to the residents.⁵⁴ The Congress resulted in the election of Tete's governor Viegas to the party's Political Commission and, as a result, President Guebuza replaced the Prime Minister with him. Consequently, nearly two decades after privatization, Pitcher's claim that the party curries favor with local constituencies through regulatory engagement is particularly relevant in Tete. To summarize upon being awarded coal concessions, the firms, constrained by the local geo-physical context of their operations, engaged in strategies for the building of support from the local population. The government's decision to compel the firm to remedy the houses and invest more locally is the result of timing, which shaped the importance of maintaining political order in Tete with minimal political costs. The change in government and firm behavior indicates that such populations indeed drive outcomes, and beliefs about them shape strategies by firms and governments.

After the protest against Vale at Cateme, Rio Tinto worked to ensure that it appeared to be living up to its remunerative commitment through the provision of well constructed houses, livelihood projects, food packages and rent in the interim, even superficial dressings such as the aesthetics of utility poles. The potential for protest drove Rio Tinto to make its attempts at building local support visible, and more durable. Interestingly, those relocated by Rio Tinto to Mualadzi, had similar complaints except for those related to the housing, which has become the poster symbol for the different ways in which the communities perceived the companies.⁵⁵ Rio Tinto was able to update its beliefs about the capacity of the residents to organize collectively to impose costs on the firm by interrupting the transportation of coal. In a region in which the state had retained limited presence since villagization, and the firm and government had limited experience with significant extractive projects, little information existed about the likelihood of resistance to firm operations.

International regulation and operational feasibility ensured that Vale engaged in some nominal form of local investment and "responsible" behavior. Until the protest, the resettlement was largely the purview of the firm, compelling no initial reaction by the government, which remained a mere passive recipient of written grievances. The protest brought the government to intervene directly in the firm's interactions with local communities. After an initial response to ensure the preservation of revenue from the coal projects, the government

⁵³Interview (2012a)

⁵⁴Davies Private Interview (2012)

⁵⁵The importance of building structure, the primary complaint of the residents in Tete dates back to the villagization of Tete.

compelled Vale to fix the houses, issuing a public statement about new specifications and ensuring that Rio Tinto would also adhere to the new requirements. Vale engaged in a highly visible campaign to fix the houses in Cateme.

The firms engaged in the provision of goods and services in and around its mining site (an incentive which might be exogenous to any regulatory requirements) in order to protect its assets in a particularly vulnerable context, once they updated their beliefs about the likelihood of resistance from the communities. The government was able to claim credit for compelling the Vale to follow through, building local legitimacy (as an enforcer and conflict mediator), even in the face of limited capacity, without engaging in all of the traditional state functions. The local population's protest served as an opportunity for the government to build support at a relatively low cost. The government was able to leverage the potential monetary costs incurred by the firm to minimize any potential political costs. It benefitted from revenue from the firm's extractive operations as well as the firm's provision of goods and services to a population during an election year.

I now turn to the case of copper extraction in Zambia and DRC to understand strategies of regulatory versus security governance in mining regions.

Mining the Copperbelt, Zambia and DRC: Security, regulation, and expectations?

The central African copperbelt is a region approximately 280 miles long and 50 miles wide striding across the Zambian-DRC border.⁵⁶ Copper ore grade is some of the highest in the world in the copperbelt, and the region has a long history of industrial copper mining. For both Zambia and DRC, government owned mining enterprises (ZCCM and Gecamines respectively) dominated the landscape until the 1990s, though the government of DRC was not a proponent of the socialist rhetorical and economic platform that characterized Zambia's government. Zambia and DRC comprised 4% and 3% of world copper production respectively in 2012. Both countries rely on the natural resource sector for government revenue⁵⁷ and DRC's Katanga Province and Zambia's Copperbelt Province contain the most significant resources for industrial scale foreign mining companies in each country.

Two copper mines, one on the Zambian side and the other on the DRC side of the border are owned by the same firm, in regions where a history of mining has left a legacy of expectations about the provision of social goods and services to populations living in and around the mine. However, in Zambia's copper site Chibuluma Mines, the firm works

⁵⁶Birchard (1940)

⁵⁷Metorex Limited (2009)

directly with local populations, to provide a range of goods and services, while in DRC's Ruashi copper mine, the local population has protested the firm's failure to do so, and the government has largely ignored this failure. This is particularly interesting given the firm's perception of the social and political risks of operating in the DRC.

One resource, one firm, two outcomes

Ruashi Mining, Katanga Province, DRC

South African firm Metorex⁵⁸ operates industrial copper mines on both sides of the border. In DRC, Metorex holds 80% equity in the Ruashi copper mining project, which is approximately 10 km east of Lubumbashi, the provincial capital of Katanga. In 2011, about 199,222 people lived in the commune of Ruashi, which includes three villages (Luano, Kalukuluku, and Kawama) that resulted from earlier mining operations by Gecamines.⁵⁹ Luano (population 10,900) and Kawama (population 42,810) are particular are affected by the Ruashi mine as a result of their close proximity to operations in the Ruashi district.⁶⁰ In December of 2006, Ruashi began identifying the property owners whose land would be appropriated by the firm in order to begin production, though members of the communities were frustrated by omissions and sluggishness. Only a subset of the population whose land had been appropriated by the company was compensated.⁶¹ The residents drafted a petition to the mayor of Lubumbashi stating, "We don't want money for our houses, we want a house at a site where there is potable water, electricity, transportation infrastructure, schools, hospitals and markets." Though the petition led the mayor and representatives from the firm to establish a commission to identify the status of each land parcel, the MOU with the firm (which estimated each parcel to be worth US\$2500) was never actually signed. While indeed some members of the community experienced an improvement in living conditions, in total, an estimated 6000 households suffered eviction or expropriation by Ruashi.⁶²

In November 2008, members of Luano blockaded all access roads to the mine, demanding the promised compensatory payments immediately. No action was taken on the part of the government, nor did the local population pursue additional protest. After the incident, there were additional claims that the company has allowed runoff to pollute the Luano river, which community members have relied upon for drinking water. Furthermore, in 2009, a

⁵⁸The firm was recently acquired by Chinese Jinchuan Group, but at the time of investment and this case study was still headquartered in South Africa.

⁵⁹Carter Center (2012)

⁶⁰As of 2009

⁶¹Centre for Research on Multinational Corporations (SOMO) and Action Against Impunity for Human Rights (ACIDH) (2011)

⁶²Carter Center (2012)

local organization⁶³ accused Ruashi of releasing industrial waste in the water supply used for agricultural irrigation, damaging crops. To compensate, Ruashi constructed two standpipes for access to clean water, though residents have claimed that one is no longer functional. While the local organization requested that the spill be investigated, the DRC's Environment Ministry never released any findings.⁶⁴

To summarize, the expropriation of land resulted in brief blockade of the road leading to the mine. However, while the firm made a token effort to address the water issue and provide some compensation, the government did not respond to the local protest by compelling the firm to follow through on its promise. In spite of government's failure to respond, the local population did not engage in further protest. The series of events above present a snapshot of the interactions among the local population, firm and government, and is a manifestation of the broader trend of governance outcomes in mining sites in Katanga.

In the case of Ruashi, the firm appears to be the only public service provider. The central government's 2010 budget allocated only 7% of domestically financed revenue to Education, Health, Agriculture, Rural Development and Infrastructure, and Public works (8% is debt related payments, and 7% as to the provinces, without earmarks).⁶⁵ In a study of the mining sector in Katanga, the World Bank noted that in general, "public security was present more often than more essential needs including potable water. In one instance, the state was not a provider at all, and the only providers were mining companies."⁶⁶ Firms have begun constructing their own roads in Katanga given limited infrastructure and while railroad lines in Katanga are operated by state owned SNCC, transport only occurs at 10-35 km/h and one-third of trains derail, costing about US\$20,000 each time.⁶⁷ Though the building of roads does affect local communities by way of connecting local markets, most road construction is primarily completed by firms to ensure lower cost transport routes to move ore to processing plants, and eventually to market.

However, beyond the construction of roads, firms in Katanga, including at the Ruashi site, appear to provide little in the way of goods and services, or mitigating the potential pollution from mining. In a report on its operations, Metorex stated that "a great deal of attention has been paid to social issues and the mine has made significant contributions, particularly in the area of water and electricity supply to local residents as well as in respect to upgrading the airport." However, only US\$1 million was spent on social initiatives during

⁶³Group for Support of Malnourished Women

⁶⁴Carter Center (2012)

⁶⁵Oil Gas and Mining Policy Division Africa Region (2013). Breakdowns of provincial budget allocation were not available.

⁶⁶Oil Gas and Mining Policy Division Africa Region (2013)

⁶⁷Environmentally and Socially Sustainable Development Africa Region (2008)

the fiscal year of 2009.⁶⁸

The government is also doing little to ensure that the firm provides services. In many cases, the government remains unaware of the extent to which firms are compliant with environmental regulations and fulfill socio-economic investment promises. CAMI is the mining registry within the Ministry of Mines that, since 2003, which allocates and documents permits and mining licenses. With only one office in Kinshasa, one that was not yet operational in Lubumbashi (as of 2007), and no operations at the provincial level, CAMI has not been allocated resources to effectively monitor and regulate mining operations and their compliance with licensing terms.⁶⁹ The Mining Inspection Services, (within the Directorate of Mines) is tasked with the monitoring health, safety, and environment in and around industrial (as well as artisanal) mining sites. However, it has a total staff of 30 for all of Katanga Province, and minimal logistical support to carry out inspections, indicating minimal investment in the allocation of resources to ensure regulatory compliance.⁷⁰

Though the government allocates limited resources (monetary and personnel) for regulatory monitoring of mining operations, limited a visible regulatory presence of the state in mining operations, the presence of the public security apparatus is much more visible. In a formal partnership in 2003 allowed private interests to purchase the use of public security for specific tasks related to mining and private protection. As Hönke (2009) notes, “the de facto privatization of the police results in the concentration of most capacities of the Police National and the Mining Police around the mines: for patrolling mining concessions, offices and the houses of senior staff of mining companies.”⁷¹ Furthermore, in a report on its operations at Ruashi, Metorex noted that “that community representation on the Community Liaison committee seems to be slanted toward government functionaries.” Metorex places visible security around mining sites, as Honke and others note, firms in the Katanga region employ public security for private protection. Instead of seeking to partner with local communities to build local support through the provision of services, government functionaries in DRC have replaced community leaders, excluding them from the process.⁷² The limited regulatory environment and strong security presence is in stark contrast to the firm and government’s more cooperative management of the Chibuluma mining site in Zambia.

⁶⁸SRK Consulting (2010)

⁶⁹Environmentally and Socially Sustainable Development Africa Region (2008)

⁷⁰Environmentally and Socially Sustainable Development Africa Region (2008)

⁷¹Hönke (2009)

⁷²SRK Consulting (2010)

Chibuluma Mine, Copperbelt Province, Zambia

In Zambia, Metorex has an 85% share in Chibuluma Mines Plc, which owns a copper mines approximately 10 km south of the town of Kalulushi that was developed in the 1950s.⁷³ The mine in Chibuluma South has both an open cast and an underground component, for which construction began in 2001.⁷⁴ With approximately 3300 houses, and the town has its own hospital, clinic, school, and recreational facilities. A paved road links the town to the larger city of Kitwe, and the town is on the electrical grid maintained by the government owned utility, ZESCO. Water is available through multiple drill holes and a pipeline from Kitwe.⁷⁵

In order to begin production, Chibuluma had to relocate approximately 90 households to nearby villages. The firm did not face any resistance to the relocation, though they noted that the local population had expectations about the benefits of the mine that were higher than could be met.⁷⁶ The community liaison and director of CSR allocation noted, “we cannot ignore the leadership hierarchies, the chiefs (Chief Nkana), headman of villages, I have to go through them. I need their support. There would be a lot of resistance from the headman, and they would make their people not see me, if I didn’t go through the headmen.”⁷⁷ The firm adopts schools in the area, and writes a regular newsletter to update the surrounding community of its activities including water monitoring, school building maintenance, and small business support. The liaison noted that the local communities expected more of the firm than it could realistically provide.⁷⁸ However, these expectations did not lead the firm to provide significant security at the mining site. Instead, the firm employs limited security through a third party that provides security guards to guard the daily shipments along the transport route.⁷⁹

In Chililabombwe, a town near Chibuluma, a local government official noted that communities are represented by councilors in areas affected by the firm, and they act as liaison with the firm to ensure communities demands are heard. She stated that firms do not decide how to invest locally by themselves, the district helps to plan local firm investment. If the community has an objection, the municipal looks at it to see if it is valid and sustainable to the community. “When it comes to resettlement, [the firms] can’t just build houses without some services for that community.”⁸⁰ Furthermore, Metorex explicitly recognized that it is

⁷³SRK Consulting (2010)

⁷⁴Zhuwakinyu (2001)

⁷⁵SRK Consulting (2010)

⁷⁶Sikamo Private Interview (2012)

⁷⁷cit_{marg}MET

⁷⁸cit_{marg}MET

⁷⁹SRK Consulting (2010)

⁸⁰Interview (2012*b*)

indeed the responsibility of local councils to provide goods and services, but the firm works to “fill in the gaps”. While the local council receives a tax, it must go to the central government of Zambia before it can be allocated back to the province. The firm-community liaison viewed the government as helpful, though wished the government would be more explicit with the firm and the communities about how taxes paid by firms were being allocated.⁸¹

In contrast to DRC, the government of Zambia has compelled firms to adhere to the provisions of their EIA and RAP. For instance, at a site in Mufulira, a local community complained of health problems related to acid mist and leaching, as well as noise pollution, dust, and cracking in their houses. Upon receiving the complaint from the community of Butondo, the government compelled the firm to suspend the portion of the mine that was producing these effects, requiring that the firm erect barriers, reduce pollution, and prepare an additional environmental and social impact plan for the leaching portion of the mine. The mine’s license had been renewed only two weeks before the complaint was launched by the community, just after ZEMA approved the site’s operations, suggesting that the local community’s discontent provoked a change in policy by the government. The firm suffered a loss of 1.5% of its annual copper production.⁸² The government shut down a portion of Ndola Lime company as well, under similar circumstances in 2011.⁸³

In a further indication of differing constellation of government and firm incentives, the Mining Union of Zambia, the largest mining union in Zambia, expressed public satisfaction with the extent to which many mining companies were providing sanitation and other services to communities near their mines. The union particularly lauded the provision of clean water and sanitation to the township of Konkola in Copperbelt Province,⁸⁴ which is located on the border of the Konkola North mining concession owned in part by Vale, who failed to successfully engage with the local population in its coal concession in Tete, Mozambique. Specifically, Vale has publicized its commitments, and specific targets for localized investment around its copper mine in northern Zambia, including the proposed funding and development of a Millennium Village.⁸⁵ While the Mines Safety Department monitors the mines’ adherence to regulations and Zambia Environmental Management Agency is responsible for evaluation the mines’ EIAs, the Miner’s Union of Zambia is involved in monitoring firm compliance with the EIA. MUZ conducts inspections for impact randomly. Thus while notably MUZ advocates specifically for mineworkers, MUZ can act as additional monitor of

⁸¹Sikamo Private Interview (2012)

⁸²*ZEMA orders Mopani mine to shut down part of its operation after complaints from Butondo community* (2006)

⁸³*Ndola lime continues operating* (2011)

⁸⁴Njovu (2012)

⁸⁵*Vale: Another quality addition to mining in Zambia* (2012)

firm compliance, thus lowering government monitoring costs and resulting in spillover affects for local communities like Chibuluma.⁸⁶

Next I demonstrate that in spite of some similarities between the extractive contexts in Zambia and DRC, the firm had different expectations about whether it would face resistance from the local population. However, these expectations on their own, turn out to be insufficient to explain the difference in governance between Metorex's copper mines.

Costs and Beliefs about Costs of Local Support

Legacy of Industrial Mining

Much like in the case of Vale and Rio Tinto in Mozambique, the local context shaped the cost of meeting local expectations for goods provision, and thus the cost to securing a social license to operate. Ruashi and Chibuluma are in regions with a history of large scale copper mining and state owned firm investment, leading to a legacy of goods provision by mining operators and resulting in strong expectations for firm compensation and distribution of benefits from the operation. However, the localized landscape shaped the cost of actually meeting those expectations. Consequently, while the firm had different beliefs about the likelihood that they would face resistance, it was the expected costs of obtaining local support and the government's response that lead to the different outcomes.

Unlike in the case of Mozambique, where industrial scale mining was relatively new, and thus firms (and the government for that matter) had limited experience to support any beliefs about the reaction of the local population to extractive operations, local populations living near mining sites in the Copperbelt region had strong expectation that a set of goods would be provided by extractive firms. Until privatization in the 1990s, Congolese parastatal companies Gecamines, OKIMO, and MIBA operated as a "state within a state", both with respect to regulatory structure and goods and service provision. This included the provision of schools, hospitals, social centers, transportation, energy, water infrastructure, and employment opportunities to residents in the area.⁸⁷ Similarly, the Zambian mining state owned enterprise, ZCCM, engaged in investment in and around extractive sites, including 'cradle to grave' welfare programs, as historically, this was a strategy for maintaining a local labor supply for firm operations.

A survey of members of mining communities in DRC conveys the local expectation of goods provision by the mining company. When local chiefs were asked who was responsible for providing services to local residents, nearly 30% said the state, while about 50% said the

⁸⁶Mushota Private Interview (2012)

⁸⁷Oil Gas and Mining Policy Division Africa Region (2013)

mining company, the rest stated either that it was unclear or that it was the responsibility of both the state and the firm. However many noted that the government was supposed to compel the firm to do so, or that since the government allowed the mining firm to operate in the area, it was the firm that was responsible.⁸⁸ In a Zambian village just south of the DRC border, a local chief and chairman expressed similar sentiments, stating that “the mining company was making a lot of money on taking copper out of the ground.”⁸⁹ He claimed that the company should not only compensate them for the noise and dust pollution from the mine construction, should continue to build another school building, as well as a clinic since that was what ZCCM had done. Metorex’s community liaison confirmed this expectation.⁹⁰ Thus, similar to the role of Gecamines in DRC, the assumption of responsibility for welfare by mining communities left a legacy of expectations by residents, even after privatization of both enterprises and the deterioration of Gecamines.

Beliefs about Resistance

Though the region’s history of mining led local populations in both Zambia and DRC to expect extractive firms to provide certain welfare services and employment, the firm had different expectations about the likelihood it would face resistance at each of its mining sites, should it fail to fulfill those expectations. Metorex acknowledged that “by virtue of the proximity of the community to the [Ruashi] mine and the inherent volatility of communities in an African context, community dissatisfaction and possible unrest represented a potential risk (for example unrealistic expectations with regard to post closure supply of services such as water) to the operation.”⁹¹ The firm noted a high level of existing violence in the community, some of which affected mining personnel. The potential for protest and riot was listed as “a key risk and management focus area,” and of the 32 risks identified by Metorex at the Ruashi site, the risks presented by the local community fell within the top five. Specifically, “the community runs riot and takes their frustration out on the mine,” which the firm viewed as particularly likely. The perception of the affect of the riot was that it would cause an interruption of production for more than six months.

As a consequence, the firm recognized that Lubumbashi, and more specifically the Ruashi villages required a high level of engagement with local communities. The firm’s stated strategies for managing this risk included the development of a social program, fair compensation and maintaining good relationships with the community. While the firm claimed that most of these strategies were already in place by 2010, investments such as ensuring

⁸⁸Dweidary et al. (N.d.)

⁸⁹Chairman Private Interview (2012)

⁹⁰Mwale Private Interview (2012)

⁹¹SRK Consulting (2010)

the availability of safe drinking water, participation in larger sustainable social programs, and the building of a security wall around the mine had not yet been made.^{92 93} In spite of these acknowledgments, the firm did not allocate more for these plans at the Ruashi site than at its Chibuluma mine.⁹⁴

In contrast, the firm had significantly different beliefs about the risks posed around the Chibuluma site in Zambia. In Zambia, the firm did not believe the local population presented a significant social or political risk. The firm noted that the local population presented “no potentially material risks”. In an assessment of the group’s risks (across all of its operations), the community related risks (incorporated under the title “political risks”) which are likely to result in business interruption, damage to equipment or property, are listed exclusively for its mine in DRC, not for the firm’s Zambian mines.⁹⁵ Miners with other firms operating in both countries noted a similar belief. One noted that “Zambians are very kind, they are very non-violent...they have never had a civil war. So I don’t think it is in the nature of the locals.”⁹⁶ An official at the Chibuluma mine stated that “in general, the local population will not do anything, they will just stop. They will do nothing physical, they do not destroy anything.”⁹⁷

If the firm believed its assets to be at greater risk from surrounding communities in DRC than in Zambia, why did it fail to address the local population’s complaints? Why did the local population not continue to protest? And if the firm did not believe the local population in Zambia would engage in protest that would materially affect their operations, why did they pursue localized goods provision to secure local legitimacy from the local population? Two factors overshadowed this difference to explain the different governance outcome in DRC versus that in Zambia: the material costs of meeting local expectations, and the expected government response to resistance.

Costs of fulfilling promises

Though the countries shared a history of industrial copper mining along the copperbelt, the countries’ different trajectories through the privatization process resulted in significantly different baseline infrastructure and demographics, which affected the costs to the firm of meeting local expectations. The government of DRC allowed GECAMINES to enter into

⁹²SRK Consulting (2010)

⁹³Interestingly, at the time of privatization, an agreement between the parastatals and private firms indicate that the private firm is explicitly not responsible for assuming the responsibility of providing social services.Oil Gas and Mining Policy Division Africa Region (2013)

⁹⁴SRK Consulting (2010)

⁹⁵SRK Consulting (2010)

⁹⁶Svendlund Private Interview (2012)

⁹⁷Sikamo Private Interview (2012)

shared agreements with private firms only after bankruptcy, and significant deterioration of infrastructure and failure to pay wages for employees of the mine. GECAMINES could support all of its social commitments when production was at 400,000 metric tonnes of copper per year, but with the planned production to be restored at 30,000, the SOE suggested that the government, NGOs, or the church would assume these responsibilities.⁹⁸

In contrast, Zambia's ZCCM entered into shared equity agreements with private partners before insolvency, and thus secured the continued investment in existing mining regions. Though socio-economic conditions and infrastructure did deteriorate in the interim while ZCCM was being unbundled (between 1992-1997),⁹⁹ production soon rebounded. Furthermore, as the community liaison at Chibuluma noted, the local population is, generally, relatively well educated,¹⁰⁰ facilitating training of a local work force for the mine (instead of recruiting labor from elsewhere).¹⁰¹ Thus, by the time Metorex began operations at its Ruashi and Chibuluma mines, the baseline landscape of infrastructure and human capital at each country's mining site looked very different. Specifically, Ruashi required more investment in human capital to train a local work force than did Chibuluma, and the dilapidated infrastructure of Ruashi required significantly more infrastructure.

In addition to existing infrastructure and human capital, the actual costs of production at the mining sites differ significantly. The firm's operating and expected closure costs are much greater at Ruashi than at Chibuluma. Chibuluma has one of the lowest cost per unit production of the copper mines in Zambia, at approximately half of the cash cost per tonne produced at Ruashi. The firm's anticipated closure liabilities at Ruashi are US\$14,950,000,000 while at Chibuluma the firm anticipates spending US\$2,624,000,000 to close the mine in accordance with national environmental standards.¹⁰² Such a significant difference, particularly when viewed in light of the higher per unit operating costs make the Ruashi a significantly more expensive operation, and thus likely constrained the firm's willingness to allocate significant funds to immediate socio-economic improvement efforts.

In addition to the local demographic and environmental context, the firm's perception of the tax burden also shapes the firm's cost and willingness to engage in sustained, local, investment. Firms often have an expectation that they will receive some form of tax break from the government for this localized development, including public goods and service provision. One miner stated, "You cannot expect us to develop your country, build roads,

⁹⁸World Bank (2007)

⁹⁹Lungu and Mulenga (2005)

¹⁰⁰Firm officials elsewhere frequently mentioned the lack of human capital as a justification for non-local labor recruitment.

¹⁰¹Mwale Private Interview (2012)

¹⁰²Metorex Limited (2010)

and at the same time pay taxes. So if we need to put down these kilometers of roads, we want a tax discount for that. So if we are building 5,000 houses, we are building sewers, water supply, electricity supply...”¹⁰³ The community liaison at Chibuluma confirmed that higher tax rate lead to more stringent limitations on the firm’s allocation of resources to local services for the communities.¹⁰⁴ This is particularly relevant in the DRC, where the effective rate of taxation is 46%. While this is only in the upper-mid range of countries with similar mineral portfolios (it is in the upper third of all mining countries),¹⁰⁵ the IMF’s Doing Business Index indicated that firms expect the tax burden to be nearly 300% of profits. In contrast, when Metorex was developing a local investment plan for its Chibuluma project, the royalties rate was a significantly lower .6% of gross revenue, with corporate tax of 30% of taxable income. Though in April 2008, there was a proposed increase to 3%, with additional windfall/variable tax proposal, Zambia’s non-governmental Chamber of Mines objected and while the variable/windfall was abandoned, the royalty rate was raised to 6% in 2011. Given a firm’s expectation of tax relief for the provision of these goods, it is not unreasonable that the firm would be less inclined to invest significantly in localized development in DRC, where it perceives the government take from mining companies to be exorbitant, in spite of the perception of a higher risk of protest.¹⁰⁶

Metorex had different expectations about the cost of doing business in DRC relative to Zambia. The local infrastructure, demographic, and environmental landscape, as well as the expected government take shaped the firm’s costs of providing goods and services, and thus its willingness to do so, even when the perceived risk of protest is particularly high. While these costs can explain why the firm’s perception of risk that could be ameliorated by sustained local engagement and investment, it does not yet provide any understanding of why the local population failed to engage in continued protest, given the firm’s failure to meet expectations near the Ruashi site.

Katanga province is characterized by several divisions among the population that have made the government particularly prone to the use of violence to protect mining interests. Particularly, the divisions between those that consider themselves to be Katanga natives, and those that come from the province of Kasai as well as divisions between those from Northern Katanga (including President Kabila) versus Southern Katanga has lead to repeated violent skirmishes, resulting in the regular use of force by Kabila. In one notable, and widely visible incident in 2004, Anvil mining provided logistical assistance to government troops, who carried out a repressive campaign against a disorganized group of six or seven who set out

¹⁰³Svendlund Private Interview (2012)

¹⁰⁴Sikamo Private Interview (2012)

¹⁰⁵Oil Gas and Mining Policy Division Africa Region (2013)

¹⁰⁶SRK Consulting (2010)

to occupy the mining town of Kilwe. The government response reportedly resulted in the death of 70-100 unarmed civilians from summary execution.¹⁰⁷ More recently, a local NGO noted of the area, that “the government seems to come in and protect the companies, I don’t have any cases in which the gov sides with the local communities.”¹⁰⁸ In Kolwezi, riots in and around the open pit mines left by Gecamines led major companies to call the police, who repressed the riots.¹⁰⁹

In another example, a Canadian mining company operating near Ruashi, relocated a community. Much like in Vale’s coal concession in Tete, the firm built houses of questionable quality, and the community had no access to fields for agricultural or potable water in their new location. The firm organized a meeting with members of the community to tell them of the project, and the firm promised schools, houses and hospitals. When the firm failed to deliver on these promises, the members of the local population stated that they considered protesting, but they feared the response of the central and local authorities. In still another nearby case in which a mining company set up a factory in the area, which resulted in significant pollution, the government did not respond. A member of a local NGO noted that the people living in the area would stop supporting the government, but that was unlikely to matter to them.¹¹⁰ One respondent noted that “the government did not care if the population existed.”¹¹¹ This historical context shaped the local population’s beliefs about the likelihood of government repression, so as to limit their engagement in continued protest. This kind of repressive campaign to protect mining sites have been rare in the Zambian copperbelt province. Thus, while both local populations had expectations of the provision of some set of social goods and services by those extracting minerals around them, the local history of violent repression indicated that expectations about how the government would respond should residents of the copperbelt protest the failure of promised provisions differed significantly.

I have illustrated that the firm had different beliefs about its operations in the two contexts: it saw local protest as likely near its Ruashi project, but not near its Chibuluma project. Additionally, it expected the government take and the local context to make the cost of providing goods and services near Ruashi to be much higher than at the Chibuluma site. Furthermore, while the historical context of copper mining in both places created expectations about the provision of goods and services in and around these sites, the local population likely had a greater expectation of repression in Ruashi, should it protest, than

¹⁰⁷ *Anvil Mining and the Kilwa Massacre, D.R. Congo: Canadian Company Implicated?* (2005)

¹⁰⁸ Impala Private Interview (2012)

¹⁰⁹ Hönke (2009)

¹¹⁰ Impala Private Interview (2012)

¹¹¹ Dweidary et al. (N.d.)

did those living in the Chibuluma site. I turn now to two aspects that shape the government's approach to managing the mining sites: the political importance of the local population in each of these sites, and the economic value of the mining project and sector.

Government Tradeoffs: Kabila's Katanga and Zambia's mining unions in the Copperbelt

Both DRC and Zambia have a diverse portfolio of mineral resources. However, while the copper belt represents a significant revenue generator for both the Zambian and Congolese governments, Ruashi is of somewhat greater strategic, monetary importance to the government of DRC, given its revenue generation relative to other extractive sites in the province, and the importance of that province for taxable industrial mining.

In DRC, the mining sector has contributed between 70-80% of export revenue,¹¹² with Katanga province generating the most revenue annually of the mineral producing provinces.¹¹³ Additionally, government revenue from the copper and cobalt projects is expected to increase from 12% of GDP to 22% of GDP between 2010 and 2016, further increasing the regions economic value to the state.¹¹⁴¹¹⁵ While DRC's copper production constituted only 2.7% of global production by 2011¹¹⁶, its cobalt production during the same year was an astounding 53.1% of global production (Zambian cobalt production constituted 5.8%). Cobalt is generally found alongside copper, and thus mines constructed for the extraction of copper are also used as infrastructure for the extraction of cobalt.¹¹⁷

Katanga's minerals comprise a significant source of revenue for the government, and within it, the Ruashi site is a particularly important source. The Ruashi site has three times the copper reserves of Chibuluma, in addition to notable cobalt reserves. The Ruashi project generated approximately \$200 million in revenue in 2009 and 2010, a modest amount relative to other industrial mining projects in the region, though its contribution to government revenue was projected to continue to grow with production increases.¹¹⁸ In 2010, Ruashi was the second largest mineral exporter (by value), exporting a total of over US\$510 million.¹¹⁹ The tax recovery rate is significantly below 100%, Katanga province has the greatest concen-

¹¹²Environmentally and Socially Sustainable Development Africa Region (2008)

¹¹³Oil Gas and Mining Policy Division Africa Region (2013)

¹¹⁴It is important to note that these are reported revenues and both the World Bank and the EITI acknowledge that government receipts constitute only a small percentage of the total amount that could be collected given the legal tax and royalty rates

¹¹⁵Oil Gas and Mining Policy Division Africa Region (2013)

¹¹⁶KPMJ (2013)

¹¹⁷KPMJ (2013)

¹¹⁸Environmentally and Socially Sustainable Development Africa Region (2008)

¹¹⁹Government of DRC (2010)

tration of industrial mining concessions of the provinces, where tax collection is significantly higher than in other provinces where artisanal mining is more common. As Snyder and Bhavnani (2005) note, industrial mining presents a tax handle that concentrates resource revenues, while artisanal mining is more costly to tax.

Zambia, in addition to being one of the top copper producers in the world, has the second largest emerald deposits as well (accounting for approximately 20% of global supply). In addition, significant grades of manganese have significant revenue potential. In 2011, Zambian copper production constituted 4.4% of global production, but in contrast to the importance of Ruashi to DRCs government as a significant revenue source, Chibuluma did not constitute such a singular source of taxable revenue. In 2009, the Zambian Revenue Authority collected approximately USD\$337 million that year from extractive companies and the mining sector contributed US\$866 million to total exports. However, Chibuluma contributed 2.42% of all of the mining contributions to government in 2009, at US\$11.5 million, ranking 7th among companies), a comparably smaller amount.¹²⁰ From Chibuluma, the government collected approximately USD\$7 million in company and windfall taxes in 2011.¹²¹ While Chibuluma presents a greater revenue source to the Zambian government than Ruashi does to the government of DRC (in absolute terms), Zambia's northwest province has significant industrial mining, presenting opportunities beyond the Copperbelt province by which to recover mineral tax revenue from industrial mining projects.

The copperbelt region represents a significant revenue generator for both the Zambian and Congolese governments, but Ruashi is of somewhat greater strategic, monetary importance to the government of DRC than Chibuluma is to Zambia. This is a result of its revenue generation relative to other extractive sites in the province, and the importance of that province for taxable industrial mining, relative to others, as noted above. Perhaps more importantly, the political salience of the region's population for the administration differs significantly between the two countries. The government of Zambia faces the potential of significant political costs to repressing resistance in a region of electorally contested support and an historically strong miner's union, neither of which constrain Kabila's government in Katanga. While the difference in regime types cannot be ignored, as it is long recognized that democracies like Zambia provide public goods (including regulatory enforcement) at a greater rate than autocracies like DRC. However, subnational variation in local governance outcomes (as described in the Mozambique cases) cannot be explained by national level characteristics, short of the interaction of these characteristics with specific, geographic contexts.

¹²⁰ *Extractive Industry Transparency Initiative Report, Zambia* (2009)

¹²¹ Website (N.d.)

In Zambia's copperbelt province, where Chibuluma is located, the support of the administration is in greater contention. In 2008, Sata of the PF received 56% of the vote in the Kalulushi district of the Copperbelt province, with Banda of the MMD receiving 36%.¹²² While not a particularly close margin, the MMD was in fact the incumbent, suggesting that support for the MMD was not a given. As one miner noted, governments perceive electoral benefits to attracting mineral companies, and compelling them to provide social services and employment to local communities. He noted, "Whoever got First Quantum to come in, they can use it in a political campaign to say, 'I provided so many jobs.'" ¹²³ If supporters indeed reward incumbents for public works projects in their region (whether the government or a firm provides it) as some literature suggests¹²⁴, then it is not surprising that a new incumbent enforces the provision of those projects to better secure his support base.

Furthermore, the presence of an historically well organized and politically affective miners union in the region makes a coordinated and mobile support block more possible. As Larmer (2006) notes, "the relative autonomy of mine townships, managed by the mine companies and policed by their own security forces rather than those of the state, provided a relatively autonomous space in which a community-based form of union organization was able to develop. Local union offices, based in mine townships (where the vast majority of mineworkers were resident) rather than in the mine itself, provided bases for the coordination and mobilization of local campaigns outside the effective control of the state, the mine company and the national union leadership."¹²⁵ Unions still serve to retain localized networks to facilitate collective action for the imposition of significant costs on the mining entity, whether publicly or privately held. Between 1986 and 2001 (during the process of privatization of ZCCM), labor union membership in the Zambian Congress of Trade Unions declined from approximately 350,000 to 250,000, but in 2006, more than 50% of the 70,000 mine workers in Zambia were non-union, and under contractual work.¹²⁶ The historical strength and political ties of the mineworkers' union (and limited co-optation) have resulted in its continued, if weakened, relevance, with potential to impose particularly high political costs, as well as economic costs.

Similar miners' unions are not present in DRC's Katanga. A Mining Union of Zambia (MUZ) official explained that he attempted to start a union like MUZ in Lubumbashi, noting "We tried to have a safety training, they have been coming here, we have tried to train them how to organize. It has been difficult because they have so many groups that want to form

¹²²Electoral Commission of Zambia (2011)

¹²³Svendlund Private Interview (2012)

¹²⁴Moser (2008), Min (2009)

¹²⁵Larmer (2006)

¹²⁶Negi (2011)

unions because there are so many minerals. There is internal competition. Each one wants to be on top. Splintering undermines presentation of united front and demands.”¹²⁷ Thus the political salience to Kabila of the population living in and around Ruashi is limited given few manifestations of organized political capital.

The Ruashi project is in Katanga Province, President Kabila’s home province. Kabila has a house that can be seen when driving north on the main road from the Zambian border. Historically, Katanga has experienced several secession attempts, and Kabila’s second home is not a particularly well veiled attempt to monitor continued efforts. However, Kabila enjoys strong support in Katanga, where electoral cleavages exist on the basis of regional and historical affiliation. Kabila is from northern Katanga, and in the country’s first multi-party election in 2006, he received first 78% and then 94% of the vote in Katanga Province, relative to 48% throughout the country.¹²⁸ His support in the province, and in general in the east of the country, is largely uncontested, insulating him from political consequences of local mining communities. Additionally, foreign miners and investors reside primarily in the provincial capital of Lubumbashi, and constitute a foreign elite on which it is suggested that Kabila relies for access to mineral rents (given the low rate of official government collection of industrial mining revenue). As a result, incentives for Kabila to compel the firm to address local complaints about pollution and unfulfilled promises are limited.

Conclusion

In the cases discussed I demonstrate variation in local governance outcomes across states and across firms. In Mozambique, firm failure to secure a social license to operate led to protest by local members adversely affected by its operations. The result was that coal firms ultimately provided a set of material goods and services, while the government provided regulatory enforcement (once the protest was sufficiently subdued). In an attempt to ensure continued operations, the firm made efforts to build local support through visibly redoubling its investment efforts. The protest provided a relatively low cost opportunity for the government, specifically Frelimo, to secure local support in a region with a traditional legitimacy deficit during a time at which it was particularly valuable for the party. The cases of Vale and Rio Tinto highlight two important aspects of the strategic context: the importance of the firms’ beliefs about the likelihood of protest, and the political salience of the local population relative to the interruptible revenue stream at the time of the protest.

In both DRC and Zambia, the history of industrial mining ensured strong local expect-

¹²⁷Mushota Private Interview (2012)

¹²⁸Weiss (2007)

tations that mining activity brought local development in the form of social goods provision by firms. However, in both countries, tradeoffs among revenue and political support dictate different strategies for indirect outsourcing of state functions to companies in pockets of extraction. In DRC, the government is more willing to trade domestic support, particularly in a region that has always supported the leader, for the easy tax handle of mining revenue.¹²⁹ Interestingly, the firm believed that protest was extremely likely near Ruashi, and indeed there was limited protest. However, even when the demands were not met by the firm or the government, the local population did not continue to protest (given their beliefs about the likelihood of repression from the historical context of the region). Though protests might have been costly for the firm, the perceived onerous tax burden, and particularly high costs to the firm of satisfying those demands (given the high operating and closer costs, as well as the limited existing infrastructure after the bankruptcy of Gecamines) ensured only a limited effort on the part of the firm to address those demands. Furthermore, the relative importance of the Ruashi mining site (for cobalt as well as copper) for state revenue and the presidential base in mining heartland, ensured a governmental preference of continued extraction by way of repression and deterrence, over costly monitoring and ensuring firm compliance.

In contrast, in Zambia, the firm believed protest to be relatively unlikely, yet engaged continuously with the local population to provide a set of social goods. Doing so was less costly near the Chibuluma mine than near Ruashi, given a more educated local population, and better existing infrastructure. The firm is more willing to incur those costs given the political relevance of the local population, which would lead the government to support them if the firm failed to meet their demands. Specifically, the history of labor unions, with minor electoral contestation for presidential support, yielded a cooperative, participatory approach to the management of mining revenue and costs.

While the cases in Mozambique highlighted the importance of firm beliefs for understanding different outcomes when the costs of meeting local expectations differed only slightly between firms, the cases in Zambia and DRC demonstrated how the relevance of those beliefs was limited by the cost of meeting local expectations and the expected government response. In the cases the local population is of strategic consideration to the firm, but local engagement is shaped by the firm's beliefs about the likelihood of protest, the government's response to firm behavior, and the relative costs of avoiding protest. Thus both firms and governments may have incentives to secure local support in these regions, which are often far from the political center of the country, but these incentives are shaped, and potentially constrained by the costs and expectations of doing so, as well as beliefs that the

¹²⁹Snyder and Bhavnani (2005)

firm, government and local population hold of each other.

Chapter 4

Protest and the Local Politics of Extraction:

Understanding patterns of protest near mining sites in Africa

The localized effects of natural resource extraction can result in conflict events such as protests, riots or sabotage. Such protests often result in a suspension of extractive operations, which is costly for both the extracting firm and the government. Specifically, the extraction of natural resources such as minerals, metals, and coal can affect the livelihoods of populations living nearby, through contaminating limited water supplies, affecting soil fertility and increasing the cost of living, which can lead them to engage in a campaign of resistance against mining firms, interrupting production.

Case studies of mining regions suggest that these protests are not limited to one region or one firm. In South America, case work on Bolivia and Peru suggest that it is common for protest to ensue around inequitable distribution of the localized benefits and costs of extraction.¹ Several cases highlighted by Downey et al. (2010) demonstrate that protestors frustrated with mining operations make use of the mining infrastructure to interrupt extraction. In China in 2005, protestors blockaded the entrance to a manganese mine to protest contamination of the water supply. In Brazil in 1998, local residents blockaded the road accessing a development parcel near a newly developed iron ore and manganese extractive

¹Perreault (2006), Bury (2007)

site. In a recent article by Koubi et al. (2013), the authors conduct a survey of the evidence linking resources to conflict and find limited evidence that renewable resource scarcity to conflict, but more substantial evidence that abundance of non-renewable resources leads to conflict. But not all mining activities face local resistance, begging the question: why does mining activity face resistance in some cases but not in others? What factors make mining activities more likely to face resistance?

A systematic study of the likelihood of protest near mining sites does not exist, to date. In large part, this is the result of limited data availability on types of natural resource and conflict event location, and the limited use of technology for mapping these data points. The use of Geographic Information Systems (GIS) software has become more ubiquitous among scholars, and studies have begun to examine local and spatial determinants of conflict at the subnational level, but much of the literature retains its focus on civil war. Datasets such as UPSALA/PRIO's geographic dataset of resources, ACLED, and SCADD are most suited for subnational analysis of geographic correlates of conflict, and have led scholars to look more explicitly at the local, contextual determinants of conflict. As Buhaug and Lujala (2005) note, the level of analysis matters significantly for understanding geographic determinants of conflict, and the increased reliance on GIS can better match localized variables with localized outcomes. In one of the earliest uses of geo-referenced conflict events, Buhaug and Gates (2002) analyze the explanatory power of borders, resources, and conflict type on the location and spatial scope of a civil war. In their analysis of civil wars in Africa, Buhaug and Rød (2006) find that territorial conflict is more likely in sparsely populated border regions and far from the capital, while conflict over the regime is more likely near diamond extractive sites and the capital.

The works suggest that geography can in fact shape different aspects of the conflict. However, in spite of the growth of the use of geo-referenced data for conflict analysis, little work has been done to understand specific conflict events, such as protests and riots, forms of violence that may be less lethal than civil war, as a function of geography. Geographic variables such as environmental vulnerability and infrastructure density are likely to be particularly relevant for understanding the likelihood of protests near mining sites, but no work to date has used spatial data to assess the likelihood of these kinds of events near mining sites. I aim to pursue suggestion made by Koubi et al. (2013) of exploring lower intensity conflicts at the subnational level, as systematic study of this kind of localized conflict near mining sites is notably absent, and it is this gap that this study seeks to address.

Theory and Hypotheses

I contend that regions of natural resource extraction constitute strategic contexts, in which the interaction among extractive firms, local populations and often governments is compelled by the presence of a natural resource. Specifically, these regions, which are often far from the political center of a country but which hold significant revenue potential, compel extractive firms to engage with local populations in order to secure access to the resource and continued extraction. Natural resource extraction, particularly mineral and coal mining can yield negative environmental externalities in addition to potential rents it might generate, or the potential local development it may yield. Consequently, local populations may engage in instances of sabotage, protest, and resistance if grievances about extractive externalities emerge or local populations are excluded from economic benefits. Because such resistance can interrupt firm operations, imposing significant costs by halting production, firms often incur costs to obtain a “social license to operate” to prevent such resistance. However, the costs of obtaining such a license to operate are likely to vary by extractive site, as are the firm’s incentives for incurring that cost.

I do not aim to measure directly the relationship between firm behavior and resistance by the local population. Comparable and even moderately unbiased measurements of firm behavior across extractive operations in African countries is unavailable, and collection of this data is currently not feasible. However, one can observe characteristics of the extractive context that shape interactions between the firm and local populations that make protest more or less likely. It is the relationship between these characteristics and protest that I test here.

While the government is also a relevant actor in this context, in this paper I am concerned with the likelihood of protest (not the government response to such protest) as a result of the extractive context. Several characteristics of the extractive context shape the likelihood of protest near an extractive site including the vulnerability of local livelihoods to firm operations, the ease with which local population can impose costs on firms, the firm’s beliefs about the likelihood of resistance, and the firm’s perceived tax burden in the country of operation.

Extractive operations vary in the degree to which they negatively affect local populations. Specifically local populations who rely primarily on the natural environment for livelihoods are likelihood to be most adversely affected in already environmentally vulnerable regions. Mitigating the adverse consequences of extraction is particularly costly in such regions because minor interruptions in the environment can have significant consequences on local populations. Specifically, regions where populations have limited access to water,

or minimal yield of subsistence crops due to low fertility are particularly fragile. As a result, they are susceptible to the adverse affects of extraction, and thus mining activities in these areas are likely to have a more significant affect on the capacity for local populations to maintain a livelihood derived primarily from the natural environment.

***H1:** Mines in regions of higher environmental vulnerability (limited river density, soil vulnerability) should see more protest.*

As Scott (1987) has noted, the presence of a “line of least resistance” can shape the nature and likelihood of protest. While he is speaking of exploited peasants and “foot dragging” as a form of everyday resistance, the sentiment is relevant here as well. The infrastructure required for natural resource extraction, specifically transportation networks for carrying the resource from the point of extraction to market, can present an opportunity for local populations to impose costs on extractive firms. Local populations with grievances about the conduct of extractive firms can more easily interrupt the transport of a natural resources if the infrastructure is fragile. For example, extraction with a single rail road from the mine to the port requires only the obstruction of this one railroad to significantly interrupt firm operations and impose significant costs. This is a scenario that played out in the Tete region of Mozambique, where members of the resettled community around the coal mines in Moatize barricaded the railroad, and keeping the coal from reaching the coastal port. Those extractive sites with redundant transportation infrastructure may require more coordinated, larger scale action in order to significantly effect extractive operations. Consequently, extractive sites in regions of limited infrastructure present low cost opportunities for local populations to interrupt mining operations.

***H2:** Mines in regions with lower density transportation infrastructure should see more protest.*

As evidenced by political risk surveys of the business environment in countries targeted for foreign investment, firms develop beliefs about the riskiness of the investment environment. Specifically, firms often draw on country-wide reports that shed light on past conflicts, shaping the firms’ perceptions about the likelihood violent protest in the future. Firms are likely to use such information to make decisions about the amount and nature of investment to prevent such conflict. Higher expectations of protest or conflict in general, should make firms more likely to ensure they compensate local populations living in and around their operations, making protest less likely.

***H3:** Mines in countries that have a large number of conflicts should see less conflict relative to mining sites in other countries*

The tax burden on firms is likely to affect the firm’s calculation with regard to its local investment. If firms are required to allocate more of their revenues to taxes and fees, there is likely to be less available for local investment. As firms must pay taxes in order to continue operations in the country, local investment is likely to be secondary.

H4: *Mines in countries with higher tax rates are more likely to experience protest.*

Research Design

I use geographic information systems (GIS) to construct a dataset of mining projects and conflict events in Africa between 1990 and 2011 for testing the above hypotheses. I spatially join conflict events with mining projects throughout Africa, and several other political, economic, and environmental variables to create a dataset in which the unit of analysis is the mining site. The mining projects and their coordinates are drawn from the Raw Materials Database, a global dataset of metals, iron and coal mining projects privately held and maintained by IntierraRMG Resource Sector Intelligence which contains the GPS coordinates of each mining projects. The data on each mining project is solicited from firms by IntierraRMG contacts in each country. While missing observations are likely, because the data is supplied by firms (as opposed to governments) there is little reason to expect that the data is missing in a biased manner.

There are several benefits to using such data over existing measures of natural resources. Perhaps the greatest benefit to using this dataset is that the GPS coordinates correspond to actual extractive projects, as opposed to simply locations of reserves. Thus, it allows researchers to look only at the effect of natural resources that are in fact being (or have been) extracted. While the location of reserves (as documented in the MRDS dataset) are useful for understanding the potential natural wealth of a country or region, understanding the local effects of extraction requires knowledge that the resource in question is actually being (or has been) extracted.² Additionally, many other measures of natural resource endowment are not geo-referenced, and thus analyses must occur at the national level. Finally, those datasets of natural resources that are geo-referenced are regularly limited to one type of resource (oil or diamonds, for instance). This dataset includes minerals, coal and iron.

Conflict events are drawn from the Social Conflict in Africa Dataset (SCAD), which collects and codes individual conflict events, geocoding and dating each one. I do not restrict my analysis to only those events labeled as “protest”, related to “environmental issues” as

²I rely primarily on the GPS coordinates of each mining project, in which there were approximately 10 points that required cleaning due to typographical errors in data entry.

such labels would fail to characterize instances of sabotage or strike that may be the result of more general discontent with resource extraction. Consultation with SCAD coders indicated that reliability of the issue measure is insufficient for the study at hand.

I restrict my analysis to the years between 1990 and 2011 for both practical and theoretical reasons. Practically, this is the range for which there is spatial data on protest in Africa. Theoretically, 1990 marks the beginning of the implementation of the policies of the Washington Consensus in Africa, whereby countries were expected to embark on a set of policies aimed at economic liberalization and stabilization in exchange for foreign aid. This is particularly relevant because it marked the beginning of privatization of major industries including natural resources. While not all natural resource industries were fully privatized across the continent, and rates of privatization differed, the trend is toward private and independent enterprise, presenting a natural point of departure for developing a dataset to understand the role of these firms as emerging non-state actors in sovereign African states.

Outcome Variables

The dependent variable for my analysis are drawn from the SCAD conflict event dataset. In order to understand the likelihood that a conflict event occurs near a mining site, I use the mining site as the unit of observation, and I create a variable that takes on 1 if a conflict occurred within 15 km of a mining site, and 0 otherwise. While this distance appears arbitrary, it is a conservative estimate of a radius within which it is reasonable to expect that local populations might be affected by observable impacts of the mining operation. Because the areas of concession are not available, I cannot control explicitly for the fact that the longitude and latitude of the mining site might be in the middle of a firm's concession, which may extend several kilometers from that point. However, because the analysis is restricted to mineral resources, or what some would call "point resources", the variation of concession size is at least minimally constrained. Furthermore, local ecological conditions that vary by season and year are likely to affect the maximum radius of environmental consequence of extraction. Soil affects have been found to deteriorate at about 20 km, (Dudka and Adriano 1997) while water contamination has been identified up to 60 km away from the mine (Ashley and Lottermoser 1999) ? though this is not significantly indicative as the presence of surface water is a precondition, and a variety of other geographic factors are likely to affect the radius of environmental consequence of mining.

Explanatory Variables

I employ two variables to capture the potential environmental vulnerability near a mining site. These variables include stream density and soil productivity, drawn from the UN Program on the Environment . Each of these captures a dimension of environmental vulnerability, and is measured at the GPS coordinates of the mine project. The stream density variable captures the number of streams that occur in the area around the GPS point, and then divided by the area. An increase in the stream density should increase the average access to water by populations in the region, as well as the redundancy of stream networks, decreasing the adverse consequences of the effect of contamination of one section and the overall fragility of local livelihoods.³ Soil productivity is an index of a weighted average of the soils present in the area, according to their productivity of the most suitable crop. Thus, it is one measure for the potential fertility of the soil in a given cell, and can proxy the vulnerability of the local population's livelihood.⁴

In order to measure the interruptability of the resource, I use a measure of transportation network density. I employ ESRI's global road atlas and join it with a global map of the rail networks. I then measure the density of that joint network at a given location. Higher values indicate greater total length of road and rail in a given region, and should convey higher redundancy of the transportation network. In higher density areas, firms should have multiple routes to transport the extracted ore to processing, or to port. I also include the distance from the mine to the nearest port, which is often the final continental destination of the resource. The greater the distance, the more opportunities for interruption exist, thus I expect the distance from the mine to the nearest port to be an additional measure of interruptability.

I also calculate the cumulative number of SCAD incidents in a country at the time of the mining project. This variable can provide a proxy for the firm's expectations about the likelihood of protest at the time of investing in a major mining project. While admittedly, this measure is removed from the causal process linking the firm behavior to the likelihood of protest, it is an initial attempt to capture the extent to which firms are likely to invest

³Admittedly, a higher density of streams is may, in some cases, indicate higher interconnectivity, and thus contamination at one point could likely lead to the contamination of the whole network. Just now, such a measure of connectivity is not available. Furthermore, I am interested in capturing the general vulnerability of the local population, and limited access to water constrains local capacity to sustain livelihoods by way of limiting irrigation opportunities, as well as potable water.

⁴Maximum grain yield is another indicator of the degree of self-sufficiency in food production at the local level, which considers the maximum grain available per person. It takes into account the soil productivity index, the population density, and available agricultural land. It excludes trade as an available source of food. The correlation between these variables is .99, and when used in place of soil productivity the results are unchanged

significantly in compensation to local populations as a result of their beliefs about the likelihood of protest. Thus, a higher number of SCAD events at the time of investment should result in a lower likelihood of conflict near a mining site, as firms would take those events into account and attempt to increase investment in local communities so as to prevent conflict.

I include the effective tax rate on firms in the country, as measured and recorded by the IMF Doing Business Index.⁵ Significant missing data in this variable has resulted in the assignment of one effective tax rate per country for the entire period. While it is certainly the case that effective tax rates change over time, an analysis of those countries for which time series data is available suggests that while the variance across countries is significant, the variance across time within country is minimal. For those countries for which data existed over time, the average effective tax rate was calculated. In what follows I provide a description of the distribution of the variables and an analysis of the results.

I include several control variables that are likely correlated with one or more of the explanatory variables and the likelihood of protest. First, I calculate population density at the mining site, as this is likely to affect both transportation infrastructure and the likelihood of protest. I calculate the distance between the mine and the capital of a country in order to control for government capacity. I also calculate the normalized Polity IV score to control for regime type as this is likely related to both the cumulative number of conflicts and the likelihood of further conflict. Mining sites closer to the political center of a country are likely to have higher government presence, and thus are more likely to deter protest and resistance by local populations frustrated with the consequences of mining operations.

Analysis and Discussion

There are 1361 mining sites in Africa in the dataset, and a total of 8733 conflict events listed in SCAD between the years 1990 and 2011. I conduct a logistic analysis of the likelihood of protest within 15 km of a mining site. I address the question: given an extractive site, what is the probability that a SCAD event occurred within 15 km of the extractive site?

Below is a brief series of histograms that convey the distributions of the variables in question. They reveal that while most of the variables are clustered around lower values, there is still sufficient variance in the values for analysis. The skewed distribution of population density justifies a logarithmic transformation.⁶

⁵While this actually captures the effective tax rate on domestic businesses in the country, Markel and Shakelford (2009) suggest that effective tax rates on foreign firms are unlikely to differ significantly from effective tax rates on domestic firms.

⁶One could justify the logarithmic transformation of the distance between the mining site and the capital, but doing so does not change the results

Figure 4.1: Mines and SCAD Events

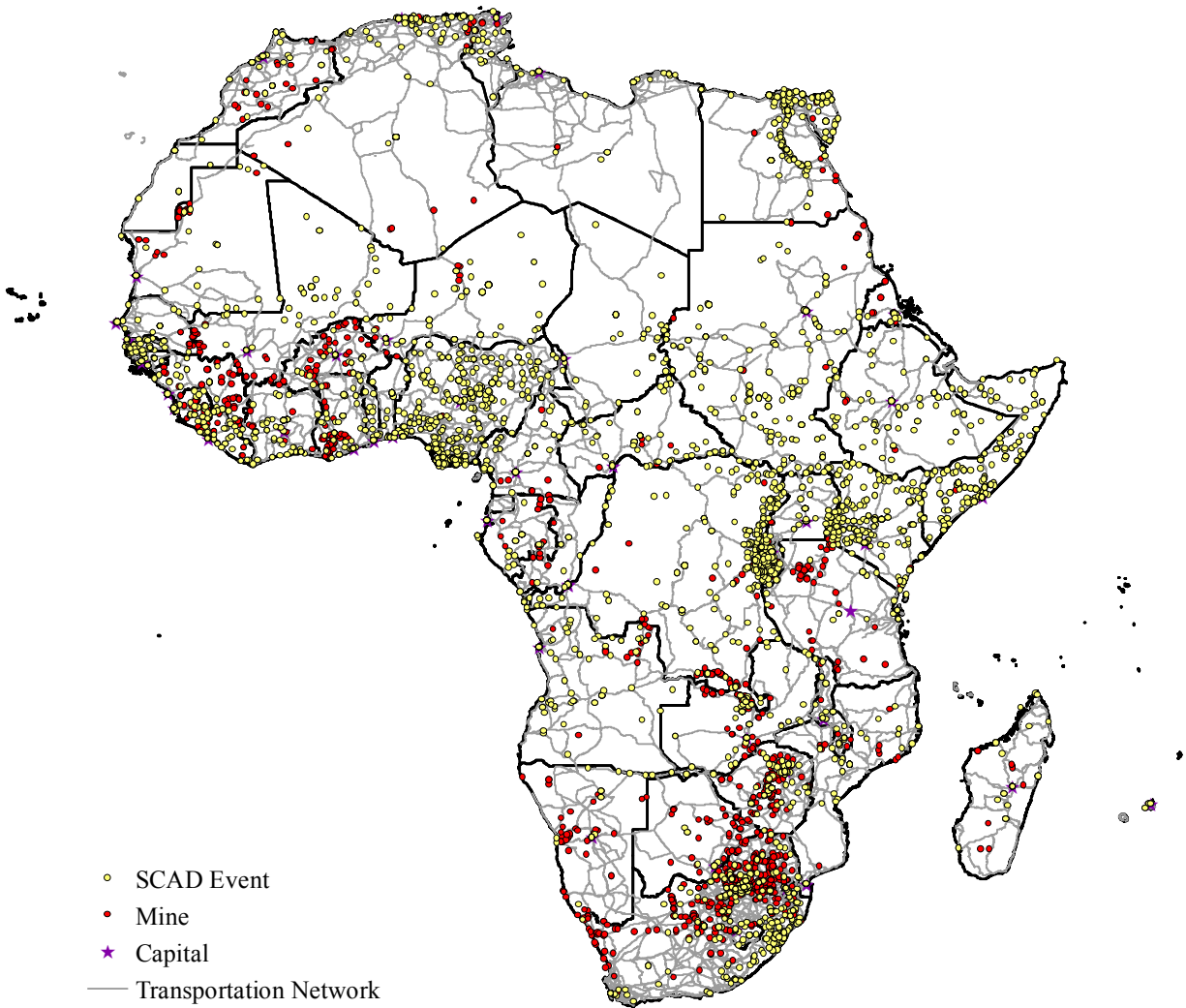


Figure 4.2: SCAD Events within 15km of a Mine

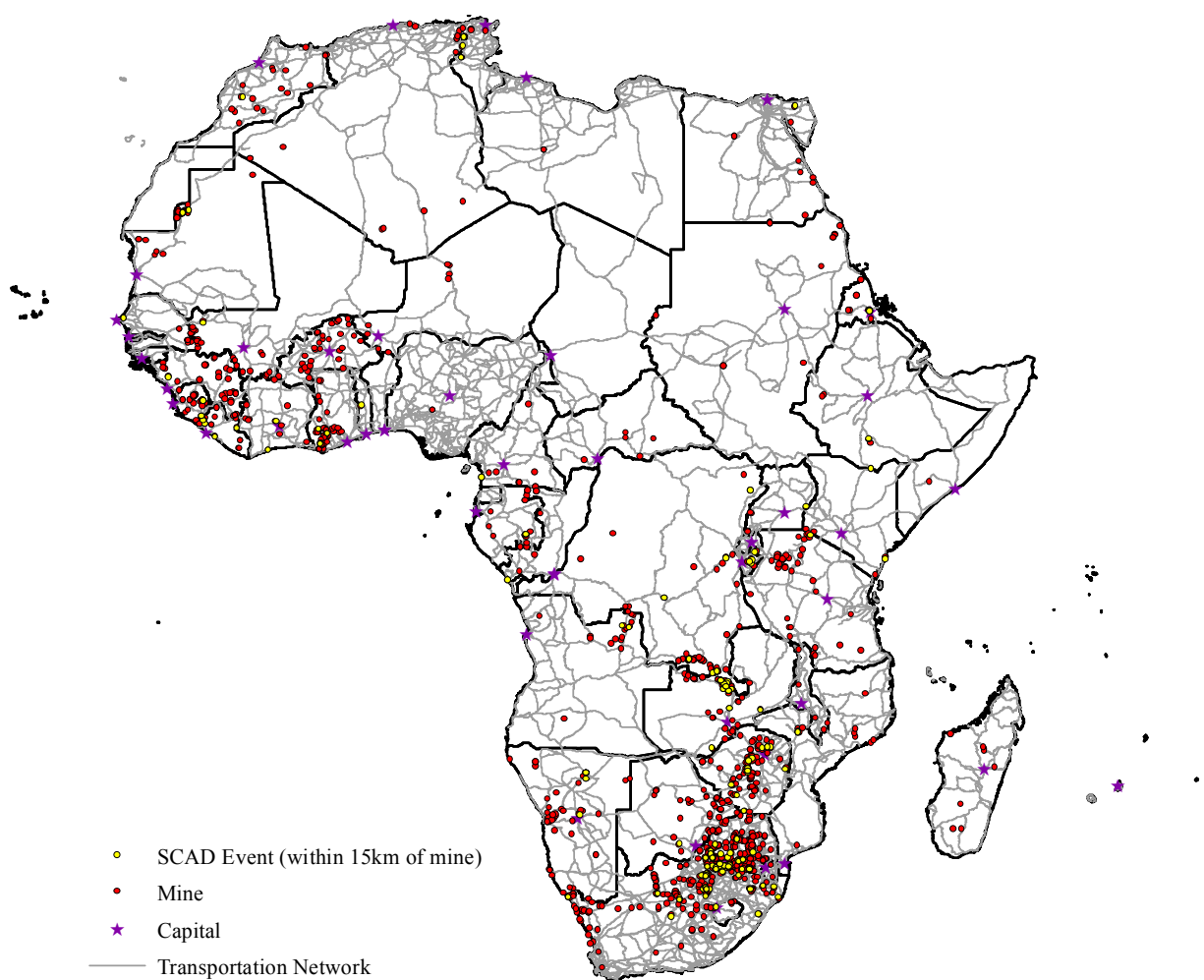
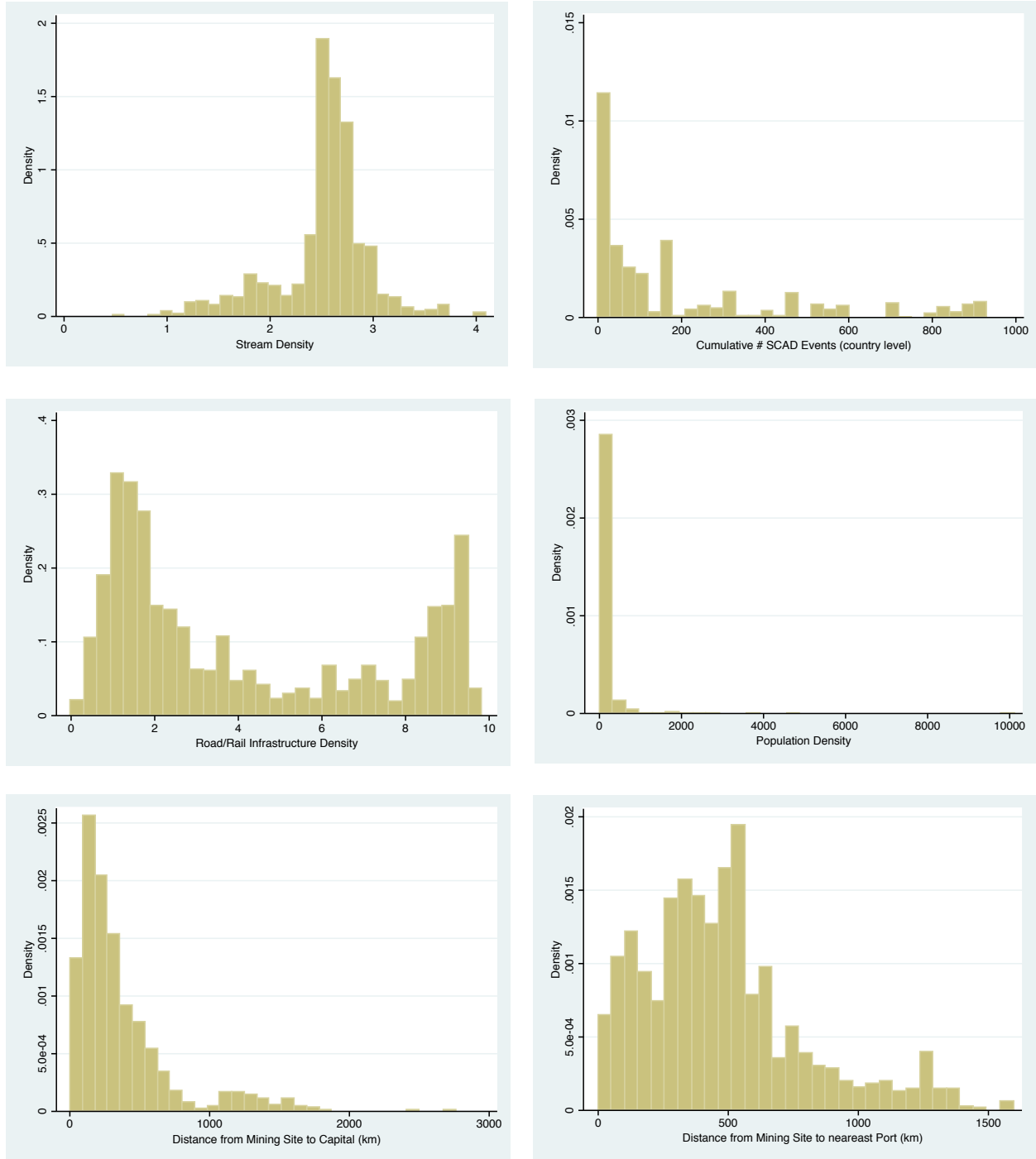


Figure 4.3: Distribution of Variables



In approximately 24% of the mining sites (328), a SCAD event occurs within 15 km. If the buffer is increased to 25 km the number increases to 487 (approximately 36%), and 880 mining sites saw a conflict event within 50 km (approximately 65%).⁷ Below I present preliminary logistic regression results to understand the likelihood of a conflict event occurring within 15 km of a mining site. Because of the hierarchical structure of the data, I have clustered the standard errors at the country level. Additionally, because of a high density of mines and conflict events in South Africa, extracting geographical distances that match mining sites with SCAD events one to one with reasonable accuracy in and around these sites is nearly impossible, and thus I include a dummy variable for South Africa.

Table 4.1: Probability of Conflict near Mine

Stream Density	-.955*** (.354)	
Soil Production		-8.01e-06 (.00004)
# Cumulative Conflicts	-.0007 *** (.0001)	-.0007*** (.0002)
Density of Transportation Infra.	.335*** (.066)	.339*** (.083)
Population Density	.436*** (.065)	.442*** (.072)
Tax Rate	.001 (.002)	.002 (.002)
Distance to Capital (mine, km)	-.00001 (.0004)	-.0001 (.0004)
Distance to Port (mine, km)	.002** (.0007)	.001* (.0007)
Polity IV	.379 (.678)	.369 (.668)
South Africa	-.538** (.434)	-.678** (.513)
Constant	-2.47** (.981)	-4.36*** (1.51)
N=1361, 1345		

Table 1 lends support for hypotheses about environmental vulnerability and cumulative conflict, and more mixed results about transportation infrastructure. An increase in stream

⁷If I drop all observations in which the mining project is only in the “Conceptual” phase, the results remain unchanged.

density near the extractive site make protest less likely, though an increase in the productivity of the soil does not have a statistically significant effect on the likelihood of protest within 15 km of the site. This might be because the effects of mining on soil may take longer to accrue, and thus adverse effects of mining on soils may not be immediately observable. Alternatively, if the soil productivity is already poor, local populations may already rely on other resources for livelihoods.

Interestingly, the density of transportation infrastructure, as measured by the density of road and rail network at the mining site has a positive effect on the likelihood of protest, contrary to my expectations. I had similar expectations as those of Buhaug and Rød: that increased transportation density near an extractive site would lessen the likelihood of protest (though admittedly by a different mechanism). While Buhaug and Rød suggest conflict should occur with greater likelihood further from the capital because of limited state presence, I find no significance in the relationship between the distance between the mine and the capital and the likelihood of conflict. Since there is a negative correlation between infrastructure density and distance to capital (-.48), which is consistent with expectations that infrastructural density decreases with distance from the seat of the state apparatus, by including both measurements I am able to (if roughly) control for government presence while evaluating the independent role of transportation infrastructure on the likelihood of conflict. It might be the case that an increase in road density facilitates coordination of the protest by creating networks for intra-group communication, and that, as a consequence, distance to port is a better indicator of the ease and effectiveness of imposing costs on the firm. However, an increase distance to port might also indicate increased interruptability of the resource, and the further the mine is from a port the more likely is protest.⁸

An increase in the number of SCAD events up until the time of the conflict event associated with the extractive site decreases the likelihood of conflict. This is consistent with the hypothesis that firms that believe there is a high probability of violent protest, are more likely to invest locally to prevent it. While a causal link is not explicitly demonstrated in this analysis, this relationship is consistent with the hypotheses that firms act strategically to prevent such conflicts.

I do not find support for a positive effect of effective tax rate the likelihood of protest. There are two potential explanations for this null result: one is theoretical, the other, empirical. First, it could be the case that firms do not factor in relative government take when making calculations about local investment, and the hypotheses I put forth is incorrect. Alternatively, expected government take could affect where firms decide to invest, but that

⁸I expected that the distance to port would affect the likelihood of protest only when road density is low, but the interaction of these terms is not statistically significant.

firms expect that government take is unlikely to change significantly and thus, at the time of extraction, they have already accounted for this cost. However, anecdotal evidence suggests that perceptions about government take directly affect how miners think about the cost and importance of local investment. As a result, it might be the case that high government take manifests as a grievance by miners, but does not ultimately affect miners' decision to invest locally. Second, effective tax rates in the dataset vary little over time, in part because of significant missing data, making the tax rate variable act more like a country level fixed effect, and therefore not capturing specifically the expected government take, but some other country, unaccounted for country specific effects.

Conclusion

The logistic analysis suggests that the extractive context matters for explaining the likelihood of nearby protest, but the results of the hypotheses tested are mixed. While I find some support for hypotheses about the likelihood of protest within 15 km of a mining site as a result of the vulnerability of local populations and firm expectations, the results suggest that an increase in the transportation network (which I use as a measure for interruptability of the resource) has a *positive and significant* effect on the likelihood of protest, as opposed to the hypothesized negative effect. This is more likely due to the possibility that road networks can effect both the interruptability of a resource and the ease of overcoming the collective action problem: lower densities of transportation network result in the former, while higher densities lead to the latter. The significant, positive effect of higher densities (and consequently, negative effect of lower densities) on the likelihood of protest suggests that the capacity of limited networks to dampen coordination efforts is stronger than any opportunity for interruption of the resource that such limited avenues of transport present. The effect of expected government take has no significance, though this is likely due to constraints on the measurement of the variable.

These results suggest that the extractive context matters for the likelihood that mining operations face local resistance. Additionally, firms use immediate history and current events to develop expectations about the riskiness of their investment, and do more to prevent conflict around their extractive sites where there expectations of conflict are higher. This analysis begins to capture the systematic effects of the interactions between firms and local populations at mining sites. However, missing from this analysis is the role of government, in both responding to these conflict events and shaping the calculations of the firm and local population. How does the likelihood that government's repress a conflict near a mining site shape the firm's investment in compensating local populations, or local population's

likelihood of protest? And from the perspective of the government, how does the presence of a mining site shape government response to conflict events? Does the presence of significant revenue potential make governments more likely to repress? There are multiple avenues for further research that can help to characterize the systematic trends of resistance, repression, and investment near mining sites that will have consequences for unpacking the microlevel politics of the natural resource curse.

Chapter 5

Protecting the Capital: Repression in regions of natural resource extraction

Does proximity to a mining site affect the likelihood that government represses a conflict event? Regions of natural resource extraction are regions where tradeoffs between political and monetary resources are likely to be particularly acute. So when do governments preference access to rents over political support in a region? Do states engage in repressive campaigns in response to contentious behavior closer to mining sites so as to protect access to resource rents? In the event that protests or instability occurs nearby a source of significant natural resource revenue, governments must respond in light of the capital benefits of extraction relative to the political consequences of repression.

Literature linking repression and natural resource wealth tends to consider the national level effects of natural resource wealth on government behavior. As outlined by Ross (2001), mineral rents can provide governments with additional resources to allocate to internal security. An authoritarian government might do so to protect itself from potential domestic pressure given the absence of democratic mechanisms for accountability, or because the existence of such wealth ensures conflict related to the distribution of resulting rents (relating repressive state behavior to the larger phenomenon linking natural resources and civil wars).¹ This literature explains why governments with significant mineral rents might be more repressive in general, but it says little about where and when a government is likely to deploy resources for repression. Davenport (2007) and other scholars focus more directly on the conflict-repression nexus, exploring which tactics of repression yield further conflict or

¹For more literature on the relationship between civil war and natural resources consider Collier and Hoeffler (1998), Collier and Hoeffler (2004), De Soysa (2002), Morrison (2009)

whether and which kinds successfully prevent it. The underlying assumption is that protest presents a threat to the government, but it is also reasonable to consider that governments might use repressive force to mitigate a threat to specific, fixed assets like natural resources, and that the geographic context (such as infrastructure or value of the asset) might shape the government's repression calculus.

Studies of spatial and geographic determinants of civil war have begun to shed light on the way geography shapes a government's perceived costs to responding to or engaging in conflict and the types of conflict that ensue. Implicit in Buhaug and Rød (2006) discussion of the local, political geographic determinants of civil war, is the way geography creates costs for government in responding to such incidents. Rough terrain and road density are hypothesized to favor rebel tactics, as Buhaug and Rød note: "roads are essential for the projection of state authority...and remote regions are harder to reach by government forces and are therefore ideal for organizing a rebellion." (pg. 319) In essence, they (among others) argue that where it is more costly to maintain a strong state presence, civil war is more likely to ensue, because it is too costly to maintain a government security presence in order to deter such campaigns. In spite of the significant potential for reverse causality (civil wars often destroy infrastructure and access to the region, making government presence more costly), this work lays the foundation for thinking about the way geography shapes the costs perceived by governments for different strategies of engagement. But how does the presence of a significant source of revenue, such as natural resources, affect the likelihood that a lower intensity conflict event is repressed? If repression is costly (both politically and fiscally), does the proximity of a geographically fixed, source of revenue make the government more willing to incur those costs?

Theory and Hypotheses

Understanding how governments might respond differently to individual conflict events such as protests or riots in different geographic locales can shed light on the way governments manage geographically pointed tradeoffs that might emerge between revenue and political support. Government response might reveal how governments decide to repress based on the revenue potential of an area relative to the political support of the population living there. Specifically, governments might engage in repression to protect sites of significant revenue potential, such as significant natural resource extraction which may, under some conditions, outweigh the political costs of losing the support of populations in the region if governments are forced to choose between ensuring the immediate continuation of resource extraction and responding to local community demands. Downey et. al. (2010) provide

some evidence that governments are indeed more likely to use repressive tactics to “support capital accumulation” related to resource extraction. They find that repression occurred against local populations protesting around mining sites of major minerals in South Africa, Mongolia, Malaysia, China, Brazil, Tibet, Sierra Leone, Indonesia, and Papua New Guinea in the last 15 years, with forced removal of local populations in countries such as South Africa, Brazil, Sierra Leone, and Kenya.

Governments are likely to engage in repressive campaigns if they believe doing so will protect assets, and if those assets are more valuable to them than any political costs they might endure by engaging in a repressive campaign. Conflict events that occur in close proximity to extractive sites can threaten government access to revenues from extraction. Conflict is destructive, and mining sites are particularly vulnerable given the reliance of production on extractive infrastructure and road and rail for the transport of raw mined ore to the port or nearest processing facility. As a result, governments may act to prevent that possibility by repressing the conflict.

***H1:** Conflicts near mines are more likely to be repressed than those farther away, ceteris paribus.*

The extent to which the government relies on revenue from the mining industry should affect the extent to which they are willing to repress a conflict. Specifically, relatively significant rents from natural resource extraction industry affects how fiscally costly government’s perceive conflict to be, particularly conflict has the potential to interrupt mining operations. Governments that rely heavily on revenue from the mining industry may wish to repress a conflict before it sufficiently affects the production, or deters other, future investment. Thus, governments should be more likely to repress conflicts near mines to prevent loss of revenue on which the government relies significantly.

***H2:** In countries with higher mineral rents, conflicts near mines are more likely to be repressed.*

Finally, drawing on Herbst (2000) and building on Buhaug and Rød’s work, consider that the government’s presence, particularly in African countries, tends to decrease in concentric circles from the political capital. Furthermore, conflict near the capital presents a direct threat to the government’s geographic seat of power. As a consequence, we might expect governments to repress conflicts that are closer to the capital.²

***H3:** Conflicts near mines that are in close proximity to the country capital should*

²We might also expect governments to repress conflicts near mining sites conditional on how far they are from the capital. However, this analysis would require the designation of threshold distances t...

see more repression.

Research Design

I use geographic information systems (GIS) to test these hypotheses on a dataset of mining projects and conflict events in Africa between 1990 and 2011. I spatially join conflict events with mining projects throughout Africa, and several other political, economic, and environmental variables to create a dataset in which the unit of analysis is the conflict event. Conflict events are drawn from the Social Conflict in Africa Dataset (SCAD), which collects and codes instances of social conflict, ranging from protest to civil war and geocodes each event. The mining projects and their coordinates are drawn from the Raw Materials Database, a global dataset of metals, iron and coal mining projects privately held and maintained by IntierraRMG Resource Sector Intelligence which contains the GPS coordinates of each mining projects.

There are several benefits to using such data over existing measures of natural resources. Perhaps the greatest benefit to using this dataset is that the GPS coordinates correspond to actual extractive projects, as opposed to simply locations of reserves. Thus, it allows researchers to look only at the effect of natural resources that are in fact being (or have been) extracted. While the location of reserves (as documented in the MRDS dataset) are useful for understanding the potential natural wealth of a country or region, understanding the local effects of extraction requires knowledge that the resource in question is actually being (or has been) extracted.³ Additionally, many other measures of natural resource endowment are not geo-referenced, and thus analyses must occur at the national level. Finally, those datasets of natural resources that are geo-referenced are regularly limited to one type of resource (oil or diamonds, for instance). This dataset includes minerals, coal and iron.

I restrict my analysis to the years between 1990 and 2011 for primarily practical reasons, though there is some theoretical justification for doing so. Practically, this is the range for which there is spatial data on lower intensity conflict in Africa. Theoretically, 1990 marks the beginning of the implementation of the policies of the Washington Consensus, specifically privatization of major industries including natural resources. While not all natural resource industries were fully privatized across the continent, and rates of privatization differed, the trend is toward private and independent enterprise, presenting a natural departure point for ensuring a degree of homogeneity among mining site ownership.

³I rely primarily on the GPS coordinates of each mining project, in which there were approximately 10 points that required cleaning due to typographical errors in data entry.

Outcome Variables

The dependent variables for my analysis are drawn from the SCAD conflict event dataset. In order to understand how the proximity of a mining site to a conflict affects the likelihood of government repression, I use the SCAD conflict event as the unit of analysis, and employ an existing variable in the SCAD dataset, *repress* to indicate whether the event was repressed. A value of 1 indicates the government repressed the event, including non-lethal repression (such as tear gas or arrests) or lethal repression in response to the event and 0 otherwise.

Explanatory Variables

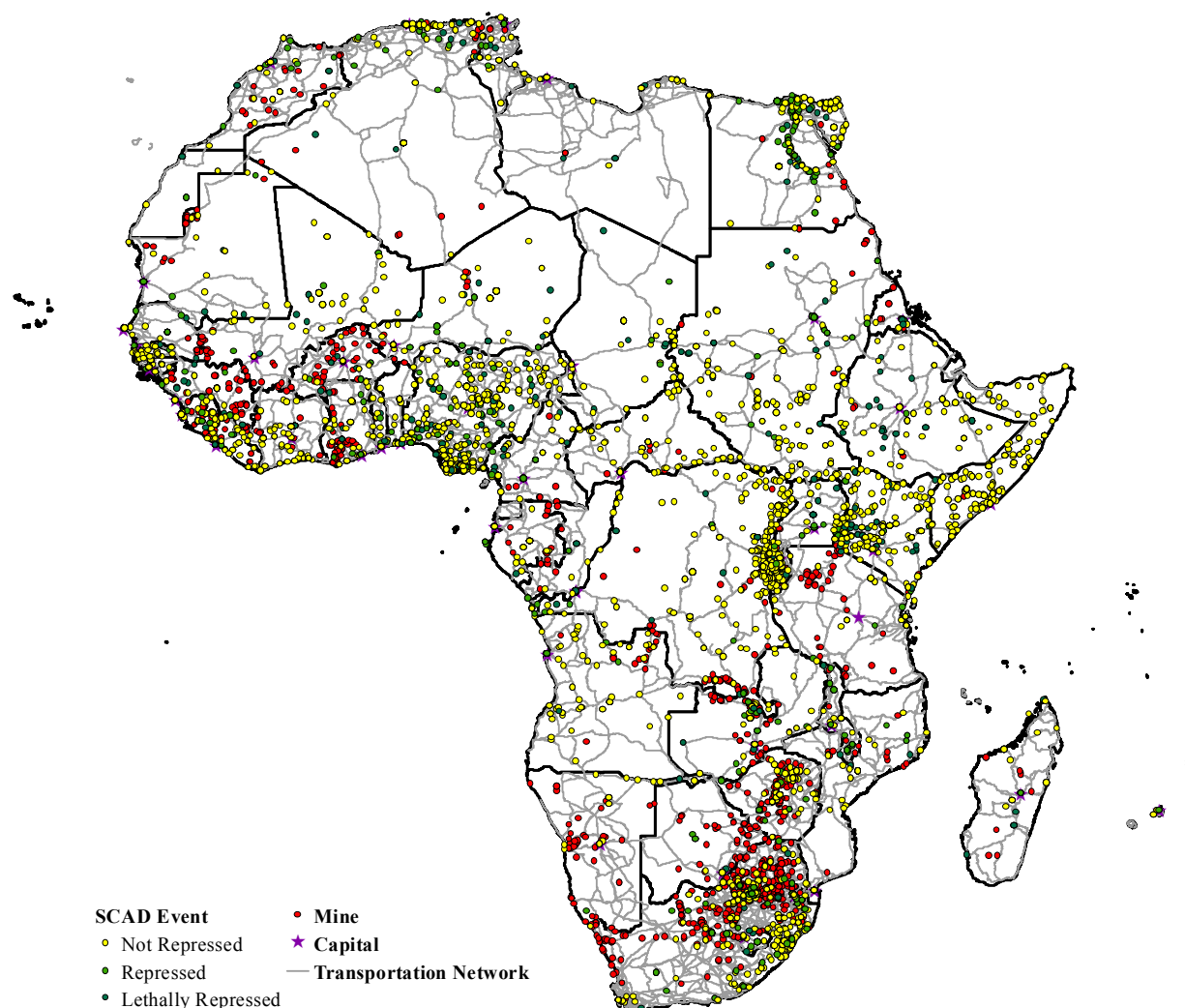
I calculate the distance between the mining project and the conflict event to measure the extent to which the conflict might threaten mining production. I also calculate the distance between the mine and the capital of a country as a coarse measure for the political relevance of the region to the political regime in order to understand the likelihood that the government represses a conflict. As Herbst and others suggest, governments are likely to care much more about what is occurring near the capital than what is occurring much farther away (in what has been called the periphery of the state). These distances are logged, as the values are concentrated in the lower end of the scale. To measure a country's reliance on mineral resources, I include the World Bank's measure of mineral rents as a percentage of GDP for the year of the conflict event, which varies over time and by country.

I include several control variables. First, I control for the population density at the point of the mine site, as well as the country's normalized Polity IV score. I control for whether the conflict was nationwide or not because it may be the case that it covaries with both the distance of the conflict from a mine and the likelihood that such an incident is repressed, as the variable indicates that such events are part of a broader, national pattern of conflict. I also control for the density of transportation infrastructure *ESRIrail*, as this is likely to be correlated with distance to capital and likelihood of repression, given Buhaug and Rød's claims about roads as indicators of governments strength. Doing so allows me to separate out the effects of distance from the capital as an indicator the extent to which the conflict threatens the capital, and the likelihood that distance of the capital also indicates ease of access by the government. Furthermore, I control for the effective tax rate on firms in the country, as measured and recorded by the IMF Doing Business Index.⁴ Significant missing data in this variable has resulted in the assignment of one effective tax rate per country for

⁴While this actually captures the effective tax rate on domestic businesses in the country, Markel and Shakelford (2009) suggest that effective tax rates on foreign firms are unlikely to differ significantly from effective tax rates on domestic firms.

the entire period. While it is certainly the case that effective tax rates change over time, an analysis of those countries for which time series data is available suggests that while the variance across countries is significant, the variance across time within country is minimal. For those countries for which data existed over time, the average effective tax rate was used. In what follows I provide a description of the distribution of the variables and an analysis of the results.

Figure 5.1: Mines and the Repression of SCAD Events



Analysis and Discussion

In Figure 2, I present the distributions of the variables used in the analysis of SCAD events and the probability of repression. Of the 8733 SCAD events, approximately 2387 (27%) are coded as repressed, though only approximately 9% of the total were “lethally repressed”. The distribution of variables included here justifies logarithmic transformation of population density and mineral rents, distance of the conflict from the capital, and distance of mine from the conflict (though logarithmic transformation is not necessary these last two variables).

In Table 1, I present the results of a logistic regression of *repression* on local and national variables. Because of the hierarchical structure of the data, I have clustered the standard errors at the country level. Additionally, because of a high density of mines and conflict events in South Africa, extracting geographical distances that match mining sites with SCAD events uniquely with reasonable accuracy in and around these sites is nearly impossible, and thus I include a dummy variable for South Africa. In Model 1, the distance variables are untransformed, while in Model 2, the distance variables and population density variable have been logged. This table also omits interactive hypothesis testing, which I address in the Table 2.

Table 1 suggests some support for the hypothesis that governments repress a conflict event with greater probability the closer the conflict event occurs to a mining site. Repression of a conflict event is also more likely if the SCAD event occurs closer to the capital city (though interestingly, this result is sensitive to logarithmic transformation). In line with Ross (2001) and the literature suggesting that mineral dependent governments are more likely to be repressive, I also find support for the hypothesis that an increase in mineral rents as a percentage of GDP makes government repression of any conflict event more likely. As expected, the effect of population density variable is sensitive to the logarithmic transformation.⁵ Interestingly, the density of transportation infrastructure which is not significant in the model. This could indicate that the ease of access by the government is not a significant predictor of whether it will engage in repression. Alternatively, because this variable does not vary over time, it may not adequately capture the state of the transportation infrastructure at the time of the SCAD event.

I also test two conditional arguments. First, I test whether the likelihood of repression of a conflict near a mining site is conditional on the distance of the conflict from the capital. I consider the interactive relationship between the distance between the SCAD event and the mine, and the distance between the SCAD event and the capital. Second, I test whether

⁵While this was anticipated in the case of population density, given the skewed distribution of the values, this finding is unexpected in the case of the nationwide variable, which is dichotomous.

Figure 5.2: Distribution of Variables

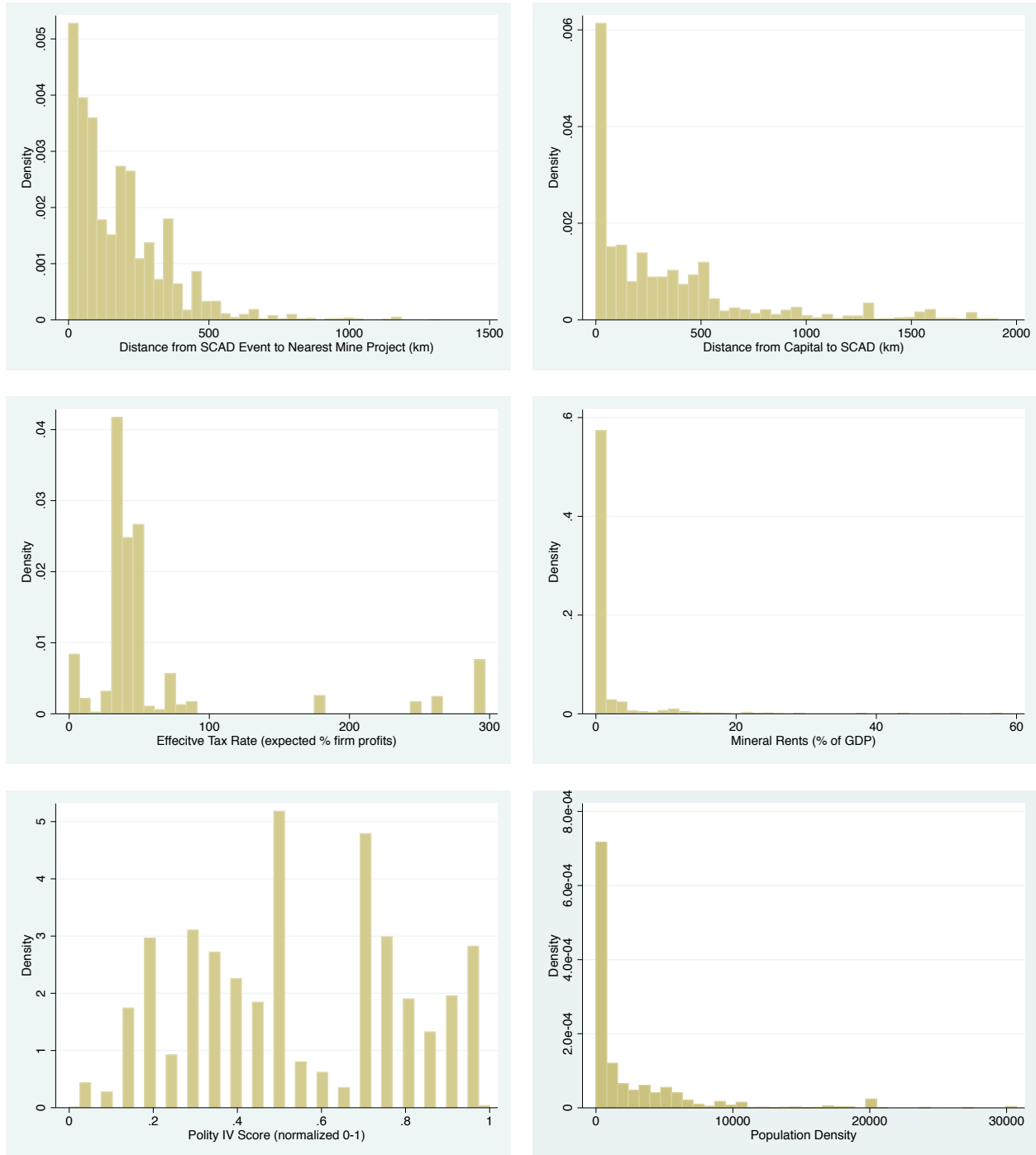


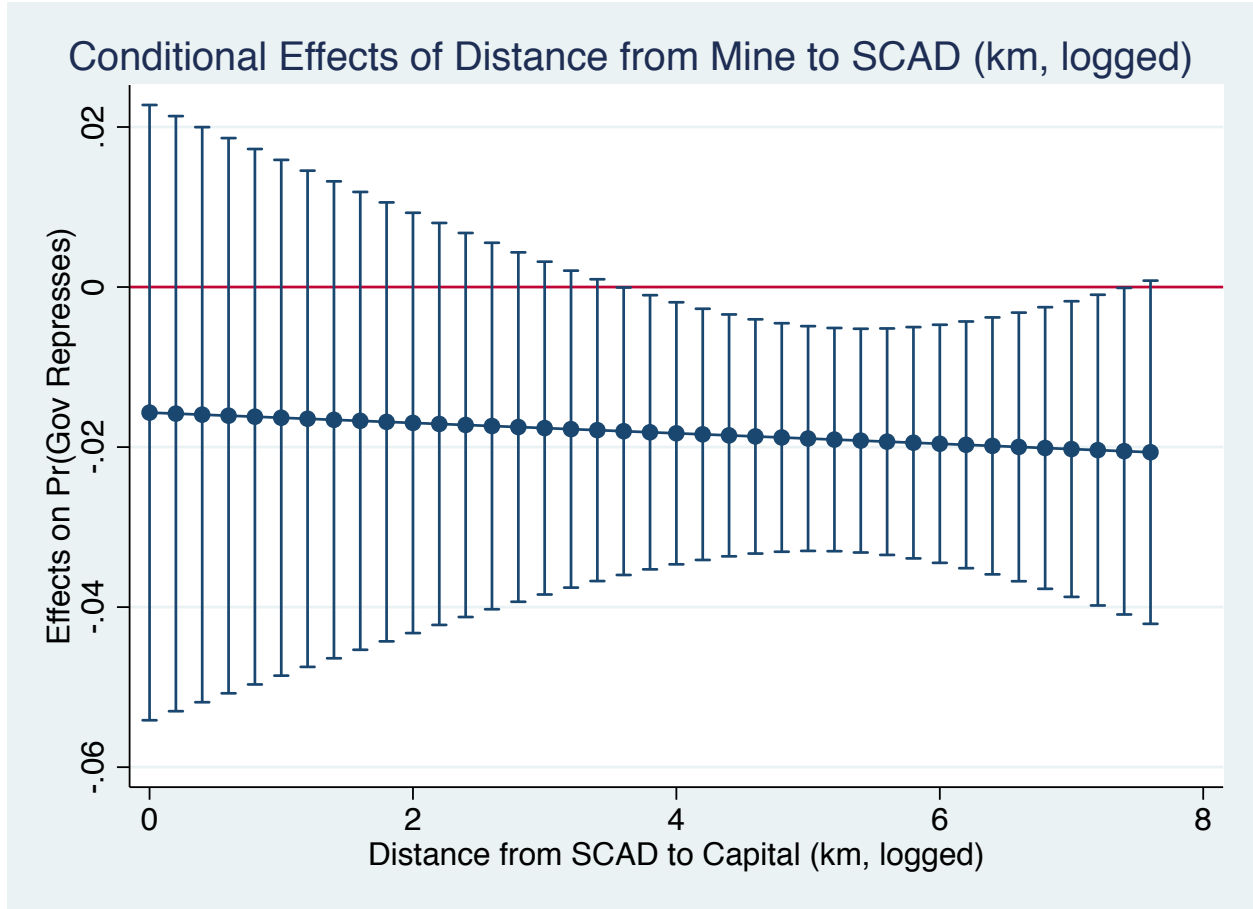
Table 5.1: Probability of Repression

	Model 1	Model 2
Distance to Mine (km)	-.0006* (.0003)	-0.096** (0.038)
Distance to Capital (SCAD, km)	-.0004* (.0002)	0.005 (0.024)
Transportation Density	.052 (.085)	0.045 (0.076)
Tax Rate	-.001 (.001)	-0.002 (0.001)
% Mineral Rents	.023*** (.007)	0.024*** (0.007)
Polity IV	-.279 (.274)	-0.358 (.28)
Population Density	.00003 (.00002)	0.116 *** (0.031)
Nationwide	.159 (.204)	0.45* (0.239)
South Africa	-1.142*** .354	-1.29*** (0.305)
constant	-.645 (.366)	-0.976** (0.45)
N=8710		

Table 5.2: Conditional Probability of Repression

	Model 3
Dist. Mine*Dist. Capital	-0.002 (0.18)
Dist. to Mine (km, logged)	-0.078 (0.107)
Dist. to Capital (SCAD, km, logged)	-0.0003 (0.0003)
Dist. Mine*% Mineral Rents	-0.003 (.006)
% Mineral Rents	0.039 (0.032)
Transport Density	0.0479 (0.074)
Tax Rate	-0.002 (0.001)
Polity IV	-0.35 (0.297)
Population Density (logged)	0.115*** (0.033)
Nationwide	0.448* (0.242)
South Africa	-1.29*** (0.319)
constant	-1.106* (0.564)
N=8710	

Figure 5.3: Conditional Effect of Distance to Mine on likelihood of Repression at Different Distances to Capital



the likelihood of repression of a conflict near a mining site is conditional government depends on mineral rents. I test these interactions in the same equation, such that the distance between SCAD and a mine site is interacted with the distance to capital, and then with the mineral rents percentage of GDP to give the following equation:

$$Pr[Repression] = \Phi(\beta_1(Dist.MineCapital) + \beta_2(Dist.MineSCAD) + \beta_3(MineralRents) + \beta_{12}(Dist.MineSCAD * Dist.MineSCAD) + \beta_{23}(MineralRents * Dist.MineSCAD) + X\beta)$$

The results are displayed in Table 2. While neither the coefficients on the interactive terms or those on the constituent terms are significant, graphing the conditional effects (Figures 3 and 4) while holding all other variables at their means yields an interesting picture.

Figure 5.4: Conditional Effect of Distance to Mine on likelihood of Repression at Different Levels of Mineral Rent Dependency

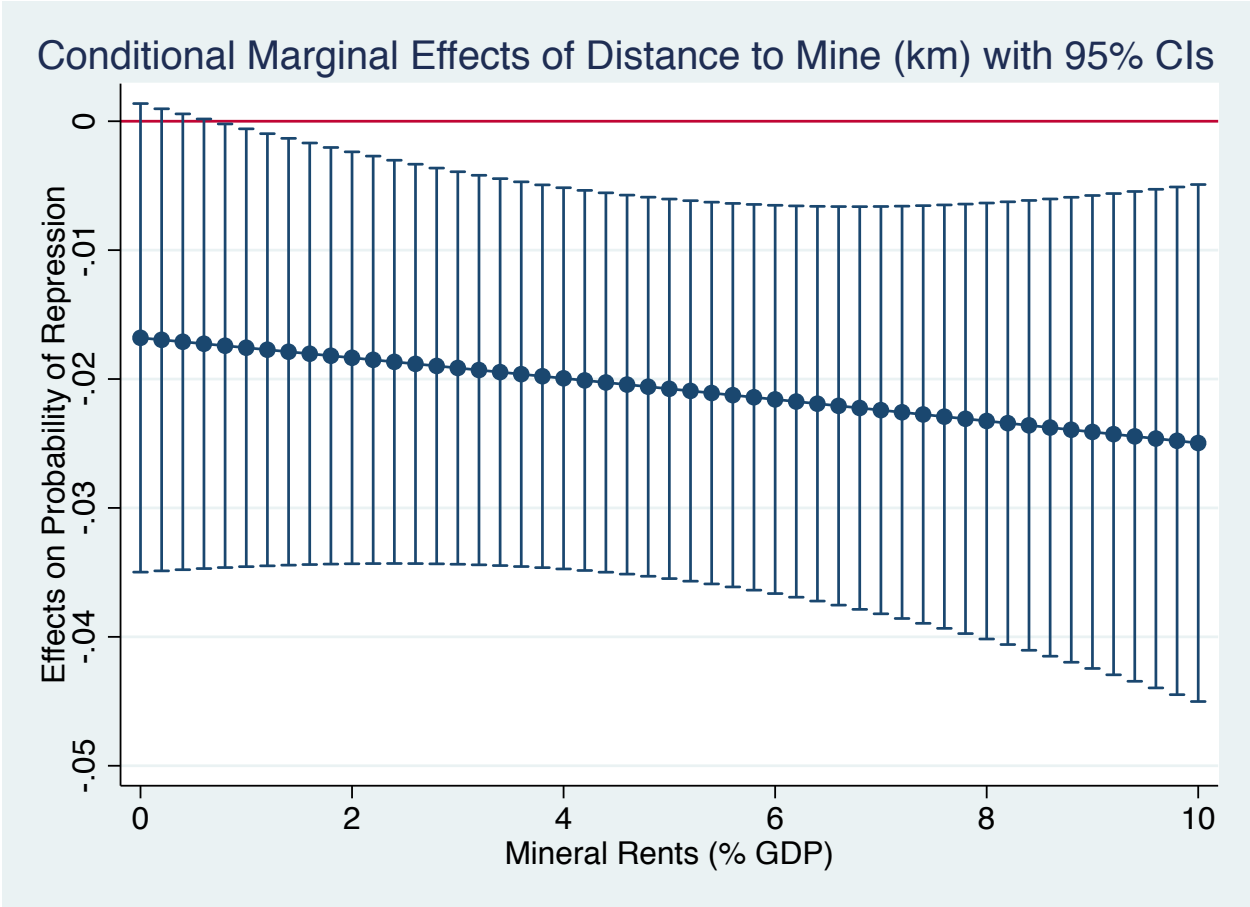


Figure 3 suggests that the effect of distance between a conflict event and a mine on repression is indeed conditional on the distance to the capital, but only if the event is sufficiently far from the capital. When the conflict event is very close to the capital, the distance to a mine site does not matter. Additionally, when the conflict is very far from the capital (which is a negligible number of cases) the distance to a mine site does not matter for the likelihood of repression. However, for approximately 70% of observations, in which the distance between the conflict event and the capital is significantly great, the closer the conflict event is to a mining site, the more likely the government is to repress it.

Figure 4 suggests that the effect of distance from the conflict event to a mine on repression is conditional on the government dependence on mineral rents. When the mineral rents comprise more than 1% of GDP, the government is more likely to repress a conflict the closer it is to a mining site. Thus, in addition to the fact that governments that rely more heavily on mineral rents are more likely to use repression in general, these governments are specifically more likely to use repression if a conflict event occurs close to the source of mineral rents.

Conclusions

The results indicate that governments may repress conflict events that have the potential to negatively affect access to natural resource revenue. Thus, governments engage in repressive campaigns in areas where revenue sources might be at risk, relative to conflict events in other regions. Indeed, the extent to which the government relies on a mineral revenue source also affects the likelihood of repression of a conflict, lending support to mechanisms outlined by Ross. The analysis also suggests that governments are indeed more likely to repress a conflict event if it is closer to the political capital but if a conflict is very close to the capital, the proximity to a mine does not have a significant affect on the likelihood that the government represses it. This suggests that the effect of the distance to the capital on the likelihood of repression trumps the effect of the distance to a mine when the capital is at significant risk.

The analysis has interesting implications for Herbst's theory of concentric circles of state presence that emanate out from the capital. Consider that the density of transportation networks has no significant effect on whether governments repress a conflict or not, suggesting that ease of access by governments and existing government presence (if indicated by roads) cannot explain as much about spatial patterns of government behavior as predicted by Buhaug and Rød. The result suggests that governments may repress conflicts that are close to the capital primarily because they pose a significant and visible existential

threat to the seat of government itself. This does not necessary preclude the importance of ease of repression given road access, after all the closer the conflict event is to the capital, regardless of transportation infrastructure, the faster the government can deploy resources to repress it. However, it does suggest that the cost deploying resources for repression (as measured by road access) is unlikely to deter government repression of a conflict event if it is near a mining site.

Additionally, the conditional effect of government reliance on mineral rents and distance to a mine on the likelihood of repression allows us to think spatially about the link between resource dependence and repression. This allows us to pin specific government responses to location, indicating that conflict events near significant, geographically pointed sources of revenue are more likely to be repressed. The results here illuminate a micro-level, spatial dimension of the prolifically discussed natural resource curse, indicating that the presence of such revenue necessitates specific responses on the part of the government that yield specific local outcomes.

This analysis is a first step in understanding whether governments are willing to engage in potentially costly repressive campaigns in order to alleviate a threat to protect significant sources of capital. However, there are numerous areas for further research. First, while the analysis indicates governments are more likely to engage in repression if a conflict event is near a geographically pointed source of revenue, it does not allow for observing or understanding any heterogeneity across those mining sites. We might expect that the likelihood of repression of a conflict event near a mining site is conditional on some other set of variables, like the revenue generated from that specific mining site, or the firm's nationality.

Ultimately, perceived tradeoffs between political support and revenue extraction might yield spatial patterns of uneven state presence: governments may engage in repressive campaigns in some regions, while they may leave extractive firms to deal with conflict in others, relying on the costs that such conflicts impose on firms to incentivize firms to do so. However, this study does not yet measure the potential political costs of such repression by considering the political relevance of the local population living near the site of extraction. While population density could proxy for this, in that governments may be less likely to repress if there is a significant population who might impose political sanctions on the government for doing so, higher population density also makes repression more likely since such conflicts are likely to be viewed as more threatening to continued resource extraction than regions with lower populations density. Thus, while these initial results suggest that geographically concentrated revenue sources draw more repressive campaigns than regions that do not have such potential for capital production, it does not yet address the question of how governments consider the potential political costs of engaging in such campaigns, and

whether politically powerful groups are more or less likely to be repressed if they engage in contentious behavior near a source of capital. Future research could start by using the geo-referenced Ethnic Power Relations Dataset to consider the relative political power of groups living in and around extractive sites to see how this affects the likelihood that a conflict near extraction is repressed.

Appendix

In what follows, I deduce the cut points for the actors beliefs that determine each of the outcomes, **Adhere, Acquiesce, Subdue and Uphold**.

The government will repress if and only if :

$$E \geq \gamma_R + \gamma_E - \tau\chi(T)$$

Otherwise it will enforce the agreement, and compel the firm to follow through. Thus we can portion the set of all values of E into two sets: E_H when $E \geq \gamma_R + \gamma_E - \tau\chi(T)$, and E_L otherwise. Define μ as the probability that the government is of the type: $E = E_H$ ($0 \leq \mu \leq 1$). In other words, this is the local population's belief that the government will repress, should it protest.

The local population may have either high cost of protest (c_H) or a low cost of protest (c_L). Assume $c_H > c_L \geq 0$. Consider the expected value to the local population of protesting and not protesting given that the firm reneges.

For $LP = c_H$:

$$EV_{LP_H}(P) = (1 - \mu)(T - c_H m) + \mu(-L - c_H m - r)$$

$$EV_{LP_H}(\neg P) = -L$$

LP_H protests if $\frac{T - c_H m + L}{T + L + v} \geq \mu$. Call this $\mu = \mu_L$.

For $LP = c_L$:

$$EV_{LP_L}(P) = (1 - \mu)(T - c_L m) + \mu(-L - c_L m - r)$$

$$EV_{LP_L}(\neg P) = -L$$

LP_L will not protest if $\frac{T - c_L m + L}{T + L + v} \leq \mu$. Call this $\mu = \mu_H$.

Note that, even if the local population knew the government would compel the firm to follow through on its promise, a local population might chose not to protest if $T < cm$. This case represents a subset of cases in which the transfer is of relatively negligible value, at least relative to the cost of protest. Field work suggests this does not represent a significant portion of the cases, but it is important to note in any case. For the interesting solution of this model, consider the cases in which $T > c_H m$.

Because $c_H > c_L \geq 0$, it must be the case that $\frac{T - c_L m + L}{T + L + v} > \frac{T - c_H m + L}{T + L + v}$. Thus, if $\frac{T - c_H m + L}{T + L + v} > \mu_L$, then $\frac{T - c_L m + L}{T + L + v} > \mu_L$. Similarly, it must be the case that if $\frac{T - c_H m + L}{T + L + v} \geq \mu_H$, then $\frac{T - c_L m + L}{T + L + v} \geq \mu_H$.

Lemma 1 *For all $\mu > \mu_H$, neither type of LP will protest. For all $\mu < \mu_L$, both types of LP*

will protest.

Because the firm is aware of this (by way of the Common Prior assumption), the cases of particular interest are those in which $\mu_L \leq \mu \leq \mu_H$.

Define ρ as the firm's belief about the probability that the local population will protest if it reneges ($0 \leq \rho \leq 1$). The firm's expected value to following through is:

$$EV_F(FT) = (1 - \tau)(\Pi - \chi(T))$$

If $G = E_H$, then

$$EV_F(\neg FT)|G_{E_H} = \rho(1 - \tau)(\Pi - r) + (1 - \rho)(1 - \tau)\Pi$$

Thus the firm chooses to follow through if:

$$(1 - \tau)(\Pi - \chi(T)) \geq \rho(1 - \tau)(\Pi - r) + (1 - \rho)(1 - \tau)\Pi$$

or

$$\rho \geq \frac{\chi(T)}{r}$$

Define ρ^H such that $\rho^H = \frac{\chi(T)}{r}$. Note that if $\chi(T) \geq r$, then the firm never chooses FT .

Lemma 2 *If $\chi(T) \geq r$, and $G = E_H$ the firm has a dominant strategy of playing $\neg FT$.*

If $G = E_L$, then

$$EV_F(\neg FT)|G_{E_L} = \rho(1 - \tau)(\Pi - r - \chi(T)) + (1 - \rho)(1 - \tau)\Pi$$

The firm chooses to follow through if:

$$(1 - \tau)(\Pi - \chi(T)) \geq \rho(1 - \tau)(\Pi - r - \chi(T)) + (1 - \rho)(1 - \tau)\Pi$$

or

$$\rho \geq \frac{\chi(T)}{r + \chi(T)}$$

Define ρ^L such that $\rho^L = \frac{\chi(T)}{r + \chi(T)}$.

Separating Equilibria

Consider that a PBE solution specifies a strategy profile $(F; LP_h, LP_l; G_{EH}, G_{EL})$ and prior beliefs for each actor (ρ, μ) . Because the firm is aware of the government's type and they share a belief about the local population's probability of protesting, we can simplify the notation to: $(F_{GH}, F_{GL}; LP_h, LP_l)$.

Consider then, that a pure separating equilibrium is one in which a firm that knew the government would repress would pursue one strategy, while a firm that knew the government would compel it to follow through would pursue another. As a result, the local population would update its prior about the likelihood that the government would repress a protest (μ) to reflect the information carried in the signal sent by the firm's decision. A Nash solution concept requires that the firm would not deviate from its strategy once it knows how the local population would respond.

Claim 1 *For all combinations of types of G and LP , and for all beliefs μ and ρ , the set of equilibria that emerge contain no separating equilibria (if $T \geq c_H m$).*

Consider the firm strategy $\neg FT, FT$. If a local population accurately learns it will be repressed from the firm's decision to play $\neg FT$, neither type of local population will play P . As a consequence neither type of firm would play FT , thus a pure strategy equilibrium in which $\neg FT, FT$ is not a Nash equilibrium.

Consider the firm strategy $FT, \neg FT$. A local population that accurately learns that the government will compel the firm to follow through from the firm's decision to play $\neg FT$, will always protest if it observes $\neg FT$. If both types of LP will protest, it is never in the firm's interest to renege. Thus a pure strategy equilibrium in which $FT, \neg FT$ is not a Nash equilibrium.

Returning to the earlier assumption that $T > c_H m$, if this is relaxed there is indeed a separating equilibrium that emerges when $c_L m \leq T \leq c_H m$. In this case, the firm with the government support will renege, and LP_L will protest, and LP_H will not protest. The firm's prior beliefs about the local population's type that sustain that equilibrium are $\rho < \rho^L$. If $T < c_L m$ however, the LP will never protest, which means that no type of firm will play FT .

Pooling and Semi-Separating Equilibria

Given Lemma 1, the firm will never play FT if $\mu > \mu^H$, and will always play FT if $\mu < \mu^L$. As a result two pooling equilibria emerge: $(FT, FT; P, P, \mu < \mu^L, \rho \geq 0)$, and $(\neg FT, \neg FT; \neg P, \neg P, \mu > \mu^H, \rho \geq 0)$.

Now consider the cases in which $\mu^L < \mu < \mu^H$. Consider that there are no cases in which LP_h protests, but LP_l does not, given that $c_h > c_l > 0$ and they share the same beliefs about the likelihood of repression. Two additional pooling equilibrium emerge: $(\neg FT, \neg FT; P, \neg P, \rho < \rho^L)$, and $(FT, FT; \neg P, P, \rho > \rho^H)$.

Finally, consider a mixed strategy in which one type of firm plays one strategy, and the other plays each strategy with some probability. Consider the case in which $(FT, FT$ with probability $\delta)$. Given that when either type of local population observes $\neg FT$, it knows the government will repress, neither type will protest. A similar logic dictates that $(FT$ with probability $\delta, FT)$ cannot be sustained as a semi-separating equilibrium. Consequently, only cases in which one type of firm plays $\neg FT$, and the other type plays FT with some probability δ can potentially constitute a PBE.

Case 1: $\neg FT, FT$ with probability δ ; $\neg P, P$ with probability α , $\mu^H > \mu > \mu^L$, $\rho > \frac{\chi(T)}{\chi(T)+r}$ Apply Bayes Rule to obtain the local population's posterior belief (μ^*) about the likelihood the government will repress given that the firm plays $\neg FT$.

$$Prob(G = G_H) | \neg FT =$$

$$\frac{(Prob(\neg FT) | G = G_H)(Prob(G = G_H))}{(Prob(\neg FT) | G = G_H)(Prob(G = G_H)) + (Prob(\neg FT) | G = G_L)(Prob(G = G_L))}$$

$$Prob(G = G_H) | \neg FT = \frac{(1)(\mu)}{(1)(\mu) + \delta(1 - \mu)} = \mu^*$$

Given the local population's posterior, solve δ such that the local population is indifferent to protest, given $\neg FT$.

$$EV_{LP}(\neg P) = EV_{LP}(P) | \neg FT$$

$$-L = \mu^* (-L - cm - v_+(1 - \mu^*)(T - cm))$$

$$\mu^* = \frac{L + T - cm}{L + v + T}$$

Note that $\mu^*_{LP_L} > \mu^*_{LP_H}$, that is, the posterior belief about the likelihood that the government will repress must be higher for LP_H than LP_L .

Solve for δ :

$$\delta = \frac{\mu(1 - \mu^*)}{\mu^* (1 - \mu)}$$

But the strategy ($\neg FT$, FT with probability δ) can only render one type of local population indifferent to playing P . Any δ that renders LP_H indifferent, would ensure LP_L protested. Consequently, a firm that knew the government was going to enforce the promise would play FT with probability δ such that $\delta = \frac{\mu(1-\mu^*_L)}{\mu^*_L(1-\mu)}$, ensuring that LP_H does not protest.

The local population plays P with some probability α so as to render the F_{G_L} indifferent to playing FT and $\neg FT$.

$$EV_{G_L}(FT) = EV_{G_L}(\neg FT)$$

$$(1 - \tau)(\Pi - \chi(T)) = \rho(\alpha(1 - \tau)(\Pi - \chi(T) - r) + (1 - \alpha)(1 - \tau)\Pi) + (1 - \rho)(1 - \tau)\Pi$$

$$\alpha = \frac{\chi(T)}{(\chi(T) + r)\rho}$$

Recall that to sustain an equilibrium the two types of local population would behave differently, it must be the case that $\mu^H > \mu > \mu^L$.

Case 2: FT with probability δ , $\neg FT$; $\neg P$, P with probability α

In order for F_{G_L} to always play $\neg FT$, it must be the case that $\rho < \frac{\chi(T)}{\chi(T) + r}$. However, if this were the case, F_H would never have an incentive to play FT . Consequently, Case 2 does not constitute a PBE.

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